DECEMBER, 1932

COTTON

Serving the
TEXTILE INDUSTRIES

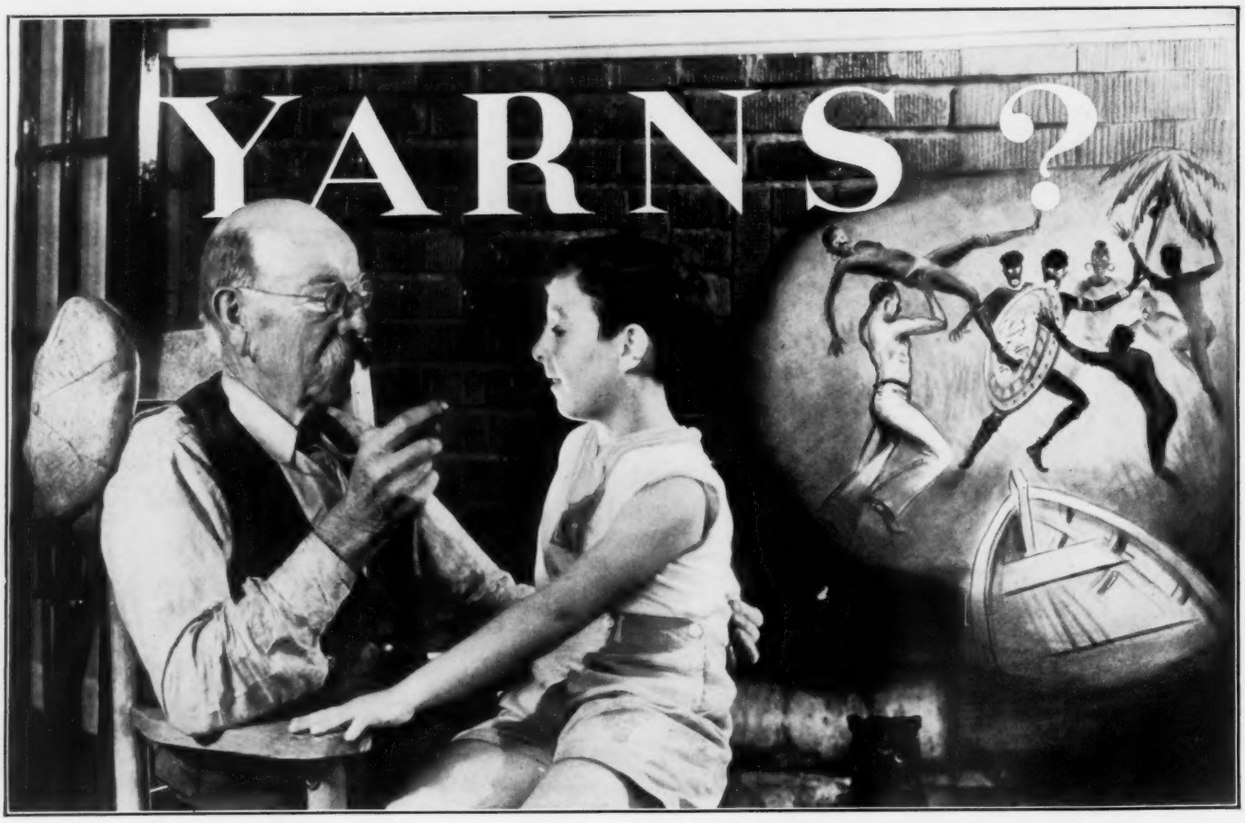
The Quality of
STANDARD—
COOSA—
THATCHER
durene
is Fixed

THE traditional quality of Standard-Coosa-Thatcher durene is maintained in every step of the process of converting high-grade raw cotton into fine knitting and weaving yarns by the single control method in our own mills.

There is always the same accuracy of count . . . the same evenness of thread . . . the same careful preparation of the finished package . . . . Plan your new numbers with Standard-Coosa-Thatcher durene.

Samples on request . . . natural, bleached or colors

STANDARD—COOSA—
THATCHER COMPANY
CHATTANOOGA, TENN.
Executive and Sales Offices: Lafayette Bldg., Philadelphia, Pa.



Yes, We Sell Cotton Yarns of Practically Every Description

For many years Franklin Process has been a "buy-word" in custom yarn dyeing. Now it has the same significance in the cotton yarn field. We are prepared to furnish cotton yarns in practically any form, that is, natural, bleached or colored (package dyed or stock dyed). Any putup can be supplied, except skeins or loom beams for package dyed yarn.

We carry a large stock of the more commonly used counts and qualities of cotton yarns for immediate delivery. Our mill connections enable us to supply other counts and qualities promptly. Our complete line includes a variety of qualities to meet practically every price requirement; also specialties (as well as standard items), such as mock twist, ratines and slub yarns.

Your inquiries will receive courteous and prompt attention.

FRANKLIN PROCESS COMPANY

Yarn Merchants and Yarn Dyers. Also M'f'rs of Glazed Yarns and Machines for Dyeing and Bleaching Yarns in the Package Form, Cotton and Wool Raw Stock, Worsted Tops and Worsted Yarn on Jackspools, also Machines for Soaking Silk.

Main Office and Plant at Providence, R. I. Branch Plants at Philadelphia, Greenville, S. C., and Chattanooga, Tenn. New York Office, 40 Worth St.

FRANKLIN PROCESS

COTTON YARNS AND CUSTOM YARN DYEING.

Adv. No. 413.

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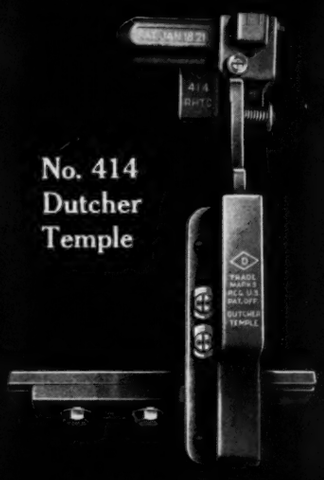
1932

IT'S NEW
IT'S BETTER



No. 414
Dutcher
Temple

The Result
of
116 Years
of
Progress
since
the Invention
of the
First Temple
which
was also a
Draper
Product

In Design, in Methods of Manufacture it
is the Best Temple ever built.
It is Stronger.
It Resists Wear.
It Operates Better.
Its Parts are More Closely Fitted.
There is Less Play, Less Lost Motion.
It Reciprocates Better.
If Repairs are needed, its Standardized Parts
fit where the old ones come off.

It Means

Better Cloth
Larger Product
Longer Life for the Temple
Lower Cost for Repairs
Less Work for the Fixer
Practically No Stops for Temple Repairs

Made for E Model Looms

Similar New Temples Coming
for other Loom Models

This is the Temple we Recommend

Where a 2½" Single Roll is desired
Allowance will be made for Thread Cutting
Temples returned to be replaced by No. 414

Draper and Dutcher Temples

Have been the American Standard for
More than 100 years
American Temples Have Always Been
the World's Best

Ira
Draper's
Temple

1816

DRAPER CORPORATION

Hopedale Massachusetts

Southern Offices Atlanta Ga and Spartanburg S C

Section of the Knitting Department, Renfro Hosiery Mill, Mount Airy, N. C. Lighting: 200 watt Glassteel Diffusers; average intensity of approximately 15 foot candles on the working plane.

23% INCREASE IN PRODUCTION *through* BETTER LIGHTING . . .

"THE installation of this modern and up-to-date lighting was the best investment we ever made", said Mr. T. C. Barber, Vice President and General Manager of the Renfro Hosiery Mill, Mount Airy, N. C.

With no other change, but a change in lighting, production increased 23% at the Renfro Mills. But that was not all. The number of "seconds" decreased. Less time was lost by machines. Operators could see easier and faster. They could detect dropped stitches and broken threads more quickly and thus reduce spoilage and delay.

Better lighting in the Renfro Mill paid for itself many times over. Better lighting will do the same in any mill.

If you wish to improve your lighting to increase production, reduce spoilage and lower costs, the services of the General Electric lighting engineers are available, without charge. General Electric Company, Nela Park, Cleveland, Ohio.

GENERAL ELECTRIC

MAZDA LAMPS

UNION BLEACHERY
LANETT BLEACHERY AND DYE WORKS
THE BROWN COTTON MILLS COMPANY
LOWELL BLEACHERY
RAMAPO FINISHING CORPORATION
NORTH CAROLINA FINISHING COMPANY
PEPPERELL
Manufacturing Company
Any mill contemplating the purchase of a Sanforizing Machine should know of this preference for the
BUTTERWORTH SANFORIZER

TODAY there are 21 Sanforizing Machines operating in plants in various parts of the country. 18 mills have Sanforizing licenses. Of these 21 machines, Butterworth has furnished 12, more equipment in dollars and cents value than any other one concern licensed by Cluett, Peabody & Co., Inc., to build Sanforizing units.

Here are the figures: —

Butterworth has built 7 Sanforizing Tenters, each 90 feet long, two without chains; 12 Palmer units; 3 complete heater houses, and 5 sets of feed rolls. This Butterworth Sanforizing equipment has been installed in the following plants: —

Delta Finishing Company, Philadelphia, Pa.
Lanett Bleachery & Dye Works, Lanett, Ala.
North Carolina Finishing Co., Salisbury, N. C.
Pepperell Manufacturing Co., Lewiston, Me.
Pepperell Manufacturing Co., Lindale, Ga.
Ramapo Finishing Corp., Sloatsburg, N. Y.
Union Bleachery, Greenville, S. C.
Ware Shoals Mfg. Co., Ware Shoals, S. C.

The Union Bleachery has installed three Sanforizers, and the Pepperell Mfg. Co. two Sanforizers. The Erwin Cotton Mills Co., West Durham, N. C., have ordered and will shortly install a Butterworth Palmer Unit, and we have just received an order for a Palmer Unit from the Lowell Bleachery, St. Louis, Mo. This, incidentally, will be the first Sanforizing Machine installed in the Middle West.

Butterworth Engineers will be glad to discuss Sanforizing in connection with **your** *products and if you desire will show you why there is so great a preference for Butterworth Sanforizers. Bulletins on Butterworth Sanforizers will be sent promptly upon request.*

H. W. BUTTERWORTH & SONS CO.

Established 1820

PHILADELPHIA, PA.

PLANTS *at* PHILADELPHIA *and* BETHAYRES, PA.

New England Office: TURKS HEAD BUILDING Providence, R. I.

In Canada: W. J. WESTAWAY CO. Hamilton, Ontario

Southern Office: JOHNSTON BUILDING Charlotte, N. C.

OVER
500,000
BALES OF COTTON A YEAR

Are made into laps

on

Aldrich Synchronized Single Process Pickers

This System Does The Best Work at the Least Cost.

Made and installed by

AldricH MachinE WorkS

Greenwood S. Carolina

BUY ON PROOF... NOT CLAIMS

WHY EXPERIMENT with other rolls when Armstrong's Seamless Cork Cots have *proved* their case in mill after mill? Don't be misguided by *mere claims* when actual cost records of over 100 leading mills, (25% of the country's total spindlage) show savings of from 50% to 80% with Armstrong's Seamless Cork Cots.

Why are more than 6,000,000 spindles at present running on Armstrong's Cots? Why are other mills changing over as fast as replacements permit? These mills, spinning from 2s to 120s, have not only proved to themselves the tremendous cash *savings* possible with Armstrong's Cork Cots, but they have also found running conditions *greatly improved* . . . "eyebrows" practically eliminated . . . clearer waste decreased . . . fewer lap-ups and hard ends . . . evener yarn.

Can you afford to overlook these accepted facts in purchasing your roll coverings? Then all we ask is that you investigate Armstrong's—the PROVED cork cot.

Write for Free Book of Facts

Send for your copy of "The Facts About Armstrong's Seamless Cork Cots" *today*. It gives actual cost studies made by the mills themselves. Learn the full details of the many advantages of Armstrong's Seamless Cork Cots. Address Armstrong Cork & Insulation Company, Cork Division, 923 Arch Street, Lancaster, Penna.

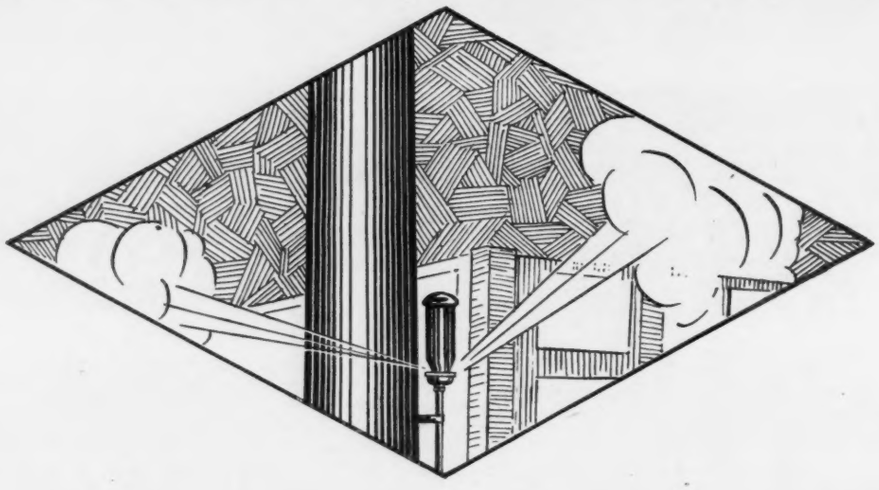
Armstrong's (A) *Product*

Armstrong's SEAMLESS *Cork Cots*

For Spinning and Card Room Rolls

TRADE MARK
TUFFER
REG. U.S. PAT. OFF.

CARD CLOTHING



DELIVERED ON TIME!

The whistle blows for the day's work to begin . . . the hustle and bustle of men getting on the job . . . "You mean the new card clothing is here already?" the carder asks of the foreman. "You only put in the order yesterday." "I know," replies the foreman, "but the 'supe' sent a wire to Howard Brothers—I'll say those birds know how to rush 'em up. Come on, get busy!"

. . . and so in scores of instances Howard Brothers have come out with flying colors in quick delivery co-operation. They make it a point to keep large stocks for immediate shipment. Their branch plants and warehouses are strategically located in textile centers.

You can get the quickest possible service, whether your requirements are Tuffer Card Clothing, Cylinder, Doffer, Stripper, Burnisher or Emery Fillets; Napper Clothing; Wire Heddles; Hand Stripping Cards; Strickles

Also speedy repairing of Top Flats and Lickerins. Extra sets of flats can be loaned to mills.

The Howard Brothers quality is known throughout the textile industry. Specify Howard on your next order.

TUFFER CARD CLOTHING IS GUARANTEED AGAINST SHELLING OUT

With the Season's Greetings

HOWARD BROS. MFG. CO.

HOME OFFICE and FACTORY: WORCESTER, MASS.

Southern Plant
244 FORSYTH ST., ATLANTA, GA.

Branch Offices
PHILADELPHIA, DALLAS and WASHINGTON, D. C.

Robinson Rayon Corporation EQUIPS THEIR TWISTERS WITH ALEMITE FITTINGS

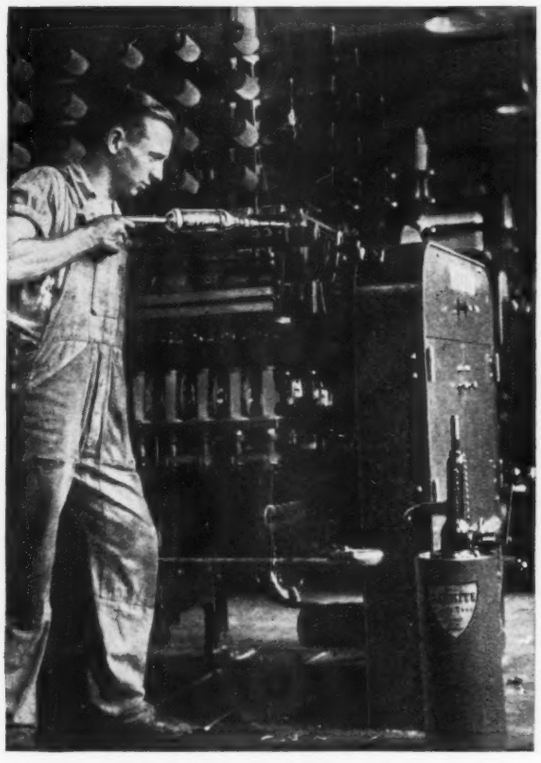
. . Why?

When the Robinson Rayon Corporation of Pawtucket, R. I., equipped 18 Whitin Twisters with Alemite push type fittings they found tremendous savings in time, labor, spoilage and lubricant cost.

With the old-fashioned grease cups and oil holes, the end rolls of the twisters could not be used because of the oil which ran out on the rolls, causing spoilage. Therefore these rolls were wasted from a production standpoint because the thread could not be kept clean of oil.

With the obsolete system of lubrication also it was found necessary to lubricate daily with oil. With the Alemite System PLUS Alemite Lubricant, it is only necessary to lubricate once a week. A saving of 500% in lubrication time!

With oil holes and grease cups it was necessary to use 2½ gallons of oil weekly on each twister at a cost of 50c! With the Alemite System PLUS Alemite Lubricant, only 1 pound of lubricant is necessary weekly at a cost of 10c. A saving of 80% in cost of lubricant.



With the Alemite System PLUS Alemite Lubricant, the full production of the twisters is made possible, due to the fact that Alemite Lubricant STAYS PUT and POSITIVELY WILL NOT RUN OUT AND CAUSE SPOILAGE!

Alemite will gladly present you with other vital facts and figures which no textile operator can AFFORD to overlook! Mail coupon for full information—TODAY!

ALEMITE CORPORATION (Division of Stewart-Warner) 651
2682 N. Crawford Avenue, Chicago, Illinois

Gentlemen: I am interested in information leading to the reduction of costs through proper lubrication.

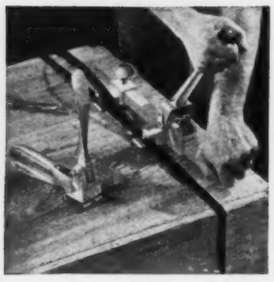
Name.....

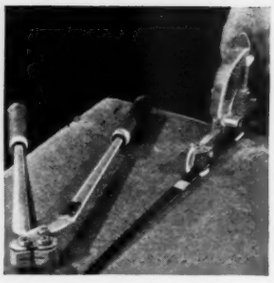
Company.....

Address.....

PIONEERS IN SPECIALIZED LUBRICATION FOR INDUSTRY

ACME





Bale and Box Strapping Equipment

Acme Steel Company has served the textile industry conscientiously and well for nearly a half century with their requirements for bale tie band and box strapping. No stone has been left unturned in the development of new equipment, in co-operation with the mills, to advance the science of better and more economical packing. . . . . Let us help you with your packing problems. Our representatives, working out of branches listed below, are at your service. . . . . Call on them—or the whole Acme company.

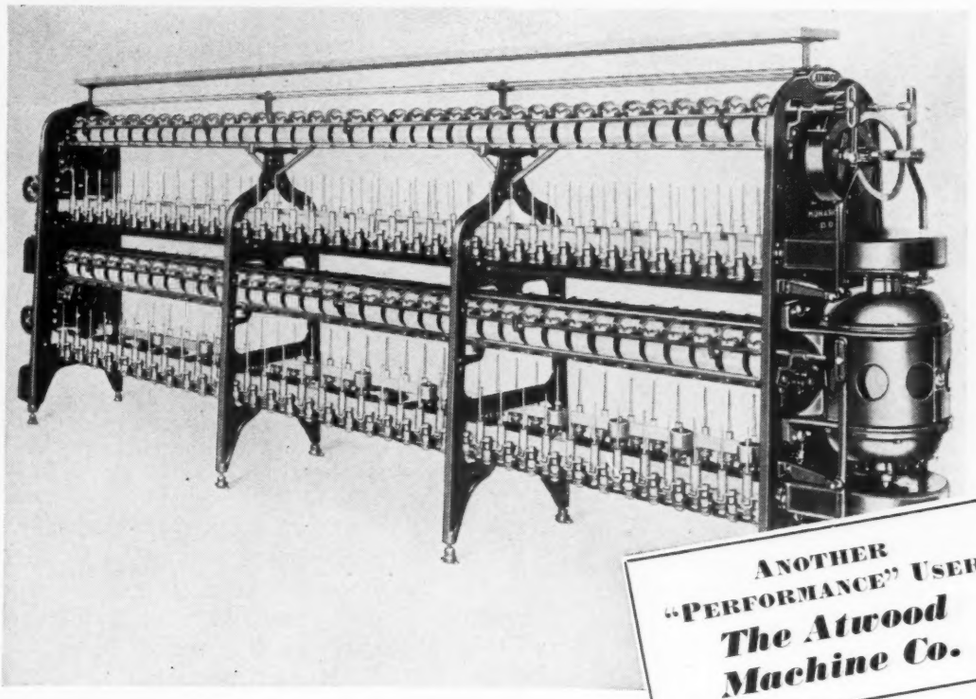
ACME STEEL COMPANY

General Offices 2832-40 Archer Ave., Chicago SAVE THE STEEL *Branches and Sales Offices in Principal Cities*

BROOKLYN, N. Y. ATLANTA, GA. CHARLOTTE, N. C. NEW ORLEANS, LA.

STEEL

CONFIDENCE IN SKF BEARINGS IS BASED ON PERFORMANCE



ANOTHER "PERFORMANCE" USER
The Atwood Machine Co.

WHERE PERFORMANCE TAKES PREFERENCE OVER PRICE

NOTHING but proven performance was the governing factor in the selection of anti-friction bearings for the Atwood double deck "Monarch" Twister. And not only are SKF Ball Bearings used on this twisting machine but also in the Diehl motor that drives it. Such complete acceptance of SKF is based on years of experience with the unfailing dependability of these ball bearings.

Modern trends of machine design call for anti-friction bearings that meet the demand of high quality and quantity production at the lowest possible cost. SKF Ball Bearings meet these exacting requirements and throughout a long life assure trouble-free machines. SKF's are smooth running, show no wear, need no adjustments and make for a cleaner machine. Results alone have been the basis on which Atwood has been 100 per cent SKF . . . that is why SKF PerformanceTakes Preference Over Price.

You may buy a bearing as a bargain but try and get a bargain out of using it, for nothing is apt to cost so much as a bearing that cost so little.

SKF INDUSTRIES, INC. 40 EAST 34th STREET, NEW YORK, N. Y.

2957

SKF

Ball and Roller Bearings

from Start to Finish

Whether they build custom bodies one at a time or low priced cars by the thousands, luxurious limousines or sturdy trucks, automotive manufacturers have achieved efficiency production standards that are the aim and envy of the mechanical world.

And as is natural where the highest efficiency standards are the rule—**Cocheco** Belting has its place in the selected service equipment of this leading industry. Quality is economy where service is the main consideration and where leather belting is used, **Cocheco,** as usual is a favorite.

Why Cocheco? *A perfectly natural question answered in our "Book on Belts." Write for it.*

I. B. Williams & Sons

Dover, New Hampshire, U. S. A.

CHICAGO **DETROIT**
NEW YORK **PHILADELPHIA**
GREENVILLE, S. C.

COCHECO TRADE MARK BELTING

DYERS!

. . who KNOW their colors . . are checking Hydrosulphite!

● Their notes from the shop are sifting through to buyers. Pens are poised to trace a new name above the dotted line!

● It's VATROLITE for '33! The Royce-made Sodium Hydrosulphite . . aptly named for *action* too. Stripping and Vat color-reduction are certified by chemical purity . . full and uniform strength . . the carefully balanced factors of a Quality program.

● Put VATROLITE to a test! Make it *show* performance! . . by way of a working sample . . *sent free!*

● ● Made on a volume scale . . Shipped *at once* . . in damp-proof drums of 50, 100 and 250 lbs. weight.

VATROLITE

SODIUM HYDROSULPHITE

REG. U.S. PAT. OFF.

ROYCE CHEMICAL COMPANY

Manufacturing Chemists

CARLTON HILL · NEW JERSEY

NEW ENGLAND REPRESENTATIVES: RICHARD HAWORTH, Inc., 35 FOUNTAIN STREET, PROVIDENCE, R. I.

SEALED RESULTS

-In Sizing and Finishing

The buyer of sizing and finishing materials today cannot afford the luxury of ordering a shipment that may turn out to be below his specifications. In all such dealings good, honest materials must be taken for granted.

But his concern cannot stop here . . . for the responsibility that supplies his finishing and sizing materials is an essential consideration. Seasoned buyers have learned from their experience to consider only supplies of long standing, with a clear record of unquestionable responsibility, with strong financial standing, and with every promise of permanence.

That these basic requirements are met by Arnold, Hoffman is attested by the fact that hundreds of textile mills have long standardized upon the "sealed results" of this company.

The Arnold, Hoffman line includes Gums, Sizing Compounds, Oils, Soaps, Dextrines and Chemicals of the highest quality. They promote faster production, real savings, more salable textiles.

Formulas for the best method of obtaining any desired finish on any fabric will be cheerfully given upon receipt of your letter.

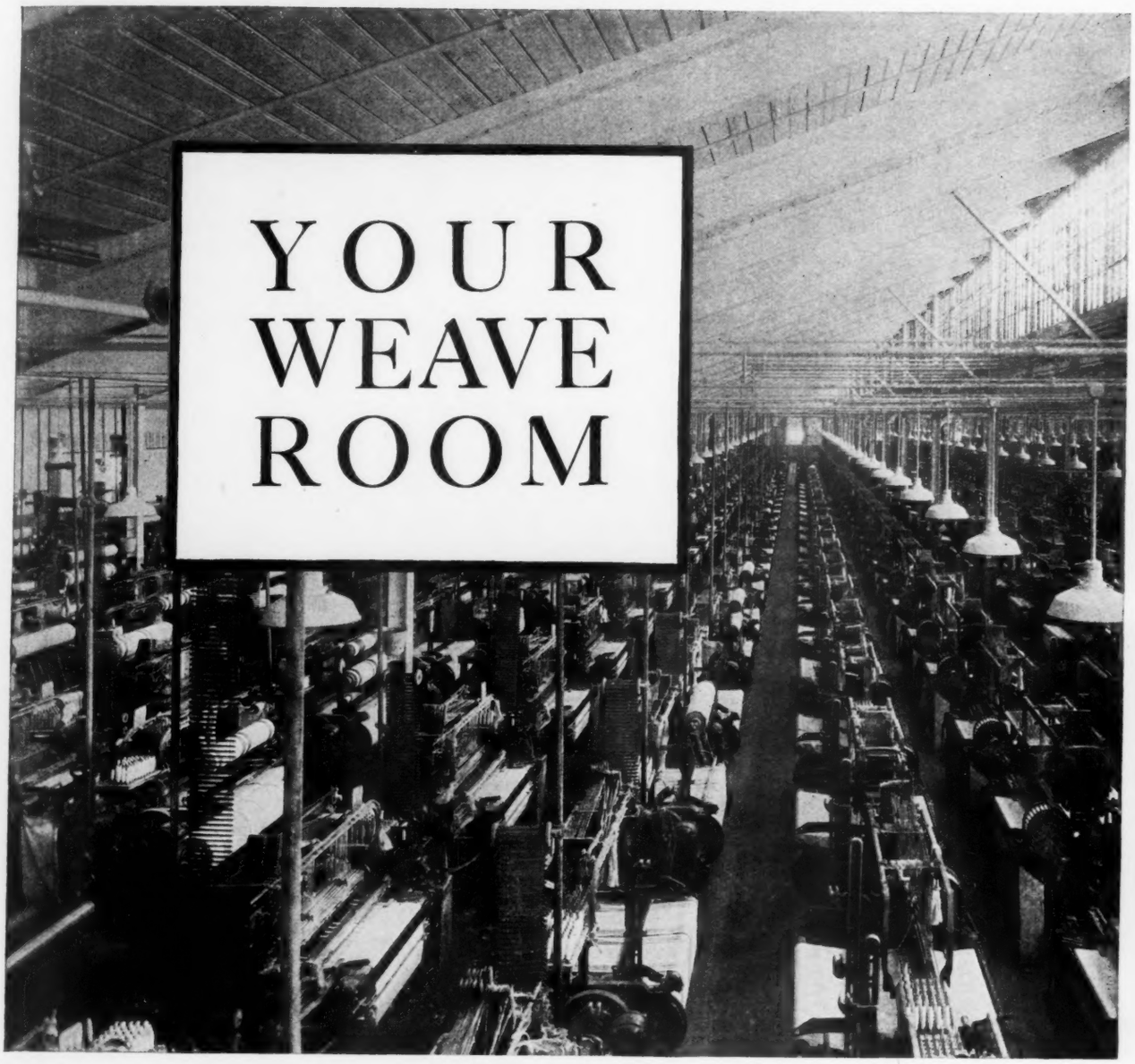
ARNOLD, HOFFMAN & CO., INC.

PROVIDENCE - NEW YORK

CHARLOTTE · PHILADELPHIA · BOSTON

PRODUCTS—Warp Dressing, Finishing Materials, Soluble Gums, Sizing Materials, Soaps, Soluble Oils, Sulphonated Oils, Alizarine Assistant, Pigments, etc.

SOLE AGENTS FOR Belle Alkali Company of Belle, W. Virginia. Liquid Chlorine, Bleaching Powder, Caustic Soda (Solid and Flaked).



Give it every chance to make good

. . use Stein-Hall sizing materials. They are uniformly high in quality and are backed by skilled technical service.

Velveen Special Warp Starch
Hawk Thin Boiling Starches
Silver Medal Pearl Starch
Calumet Warp Sizing Starch
R A Potato Starch
Raygomm
Hallmark Gum

STEIN, HALL & COMPANY, INC.

EST. 1866

285 MADISON AVENUE · NEW YORK CITY

BOSTON PROVIDENCE CHICAGO PHILADELPHIA CHARLOTTE SAN FRANCISCO
TORONTO ROCHESTER BUFFALO LOS ANGELES

Air view of mid-town New York taken from directly over The SHELTON

© Curtiss Flying Service, Inc.—Photo Division

The Heart of New York, The SHELTON ZONE

Most people who visit New York

—*spend their days and nights in the mid-town section*

It is the center of uptown business life—the shopping district—and the theatrical and night life metropolis of the world. *The* SHELTON, with its many other attractions besides convenience to these activities, has become one of the most popular of hotels among visitors to the city. In addition to supplying every possible hotel service, it gives its guests an atmosphere of quiet and comfort and hospitality that is most unusual to find in a metropolitan hotel. You'll enjoy a visit to *The* SHELTON.

Room for one, $2.50 to $3.50

Room for two, $4.00 and $4.50

Suites, $5.50 and up

The SHELTON *Swimming Pool may be used by all guests, at all times, without charge.*

The SHELTON

49th and Lexington Ave. New York

5 minutes from Grand Central Station—convenient to all business, shopping and theatrical activities in mid-town New York

YARMOR FOR SCOURING WORSTEDS

Worsteds that are scoured with soap containing Hercules Yarmor Steam-distilled Pine Oil are free of machinery oil, grease, and mill stains, thus eliminating expensive spotting operations.

Yarmor Pine Oil soaps minimize the formation of insoluble calcium and magnesium soaps and their deposition on the material being processed.

Clean, bright whites and colors are obtained and subsequent operations, such as dyeing and bleaching, are made easier by using Yarmor soaps.

For further information about scouring soaps containing Yarmor, consult your textile chemical manufacturer or distributor, or write to us.

Steam-distilled Wood Turpentine
Wood Rosin
Steam-distilled Pine Oil
Alpha Terpineol
Commercial Abietic Acid
Abalyn
Nitrocellulose
Chemical Cotton

HERCULES NAVAL STORES

HERCULES POWDER COMPANY
INCORPORATED

995 Market Street....Wilmington, Delaware

Branch Offices...Chicago...New York...St. Louis...Salt Lake City...San Francisco

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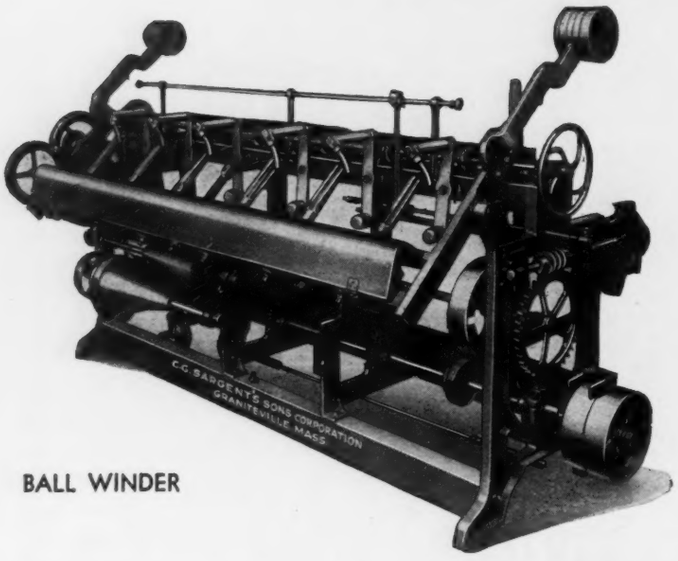
MARKET CONDITIONS DEMAND FLEXIBILITY



BALL WINDER

Sargent's Ball and Card Winders are so constructed and designed that with few adjustments these machines are rendered capable of winding various types of material into many different packages.

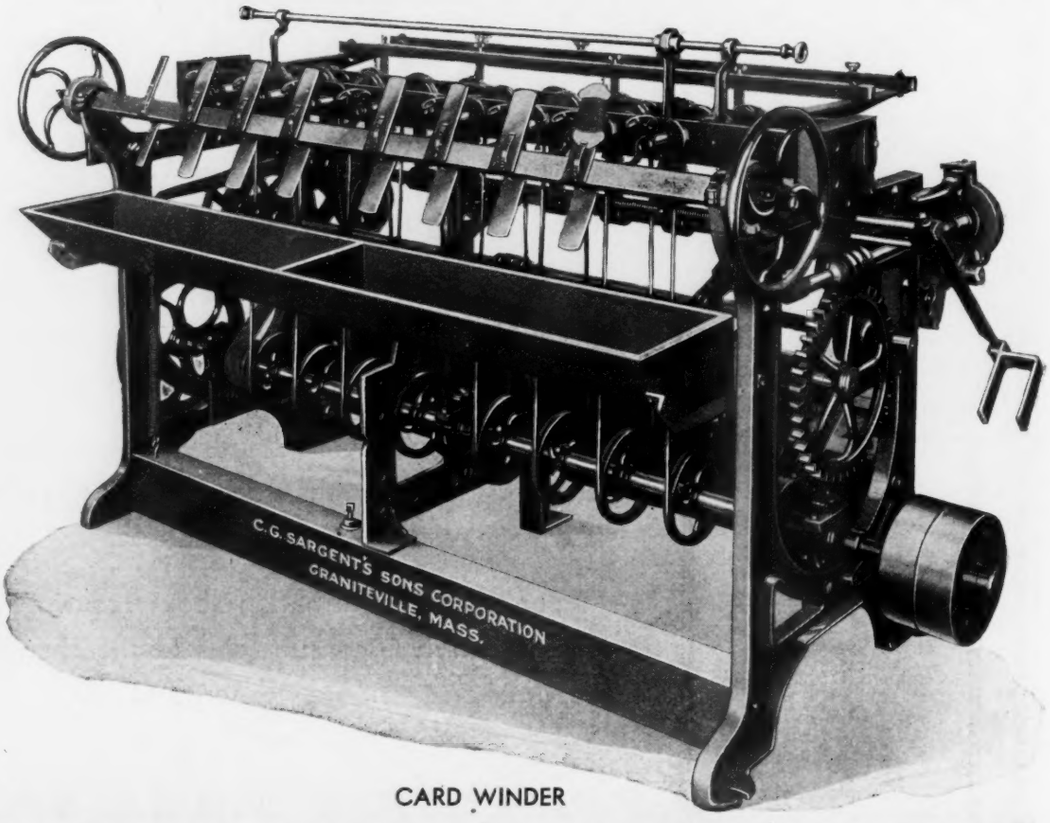
The machines pictured will wind in ball or card form tinsel, wrapping twine, cotton or woolen yarns, knitting silk, thread, wicking, hemp, jute, paper twine and ribbon.

In these times of changing markets, the manufacturer must be prepared to readjust his machinery to meet the varying demands. Sargent's Ballers and Card Winders give the mill owner a distinct advantage,—a few minor changes and he is well fitted for an entirely different market.

The flexibility of this equipment is a feature every prospective buyer should consider.

Also Manufacturers of

Automatic Feeders
Bagging Machines
Cloth Dryers
Cotton Stock Dryers
Continuous Automatic Extractors
Cotton Rinsers
Dusting Machines
Opening Pickers
Skein Dryers
Wet Pickers
Yarn Conditioning Machines



CARD WINDER

C. G. SARGENT'S SONS CORPORATION

Southern Agents
Fred H. White, Charlotte, N. C.
Fred T. Brooks, Atlanta, Ga.

Founded 1852
GRANITEVILLE MASSACHUSETTS

Phila. Agent
R. C. Jefferson Co.
Drexel Building

SARGENT IS THE PIONEER AMERICAN BUILDER OF DRYERS

Its use is INCREASING

THERE are reasons for this. Formic acid is both an acid and an aldehyde; consequently, it gives some results not obtainable with other exhaust agents.

Also, in connection with many of the dyestuffs, it gives more brilliant shades.

The merits of Formic Acid are now generally known and many mills in various parts of the country are adopting its use.

Prompt shipment from any of our branches listed below

GRASSELLI

OTHER GRASSELLI CHEMICALS FOR TEXTILE MANUFACTURERS

Acetic Acid
Acetate of Soda
Acetate of Lead
Alums, U. S. P.
Aqua Ammonia
Barium Chloride
Bi-Chromate of Soda
Bi-Sulphate of Soda
Bi-Sulphite of Soda
Carbonate of Soda
Caustic Soda, Solid and Flake
Chloride of Lime
Chloride of Zinc
Epsom Salts
Glauber's Salt
Lactic Acid
Muriatic Acid
Nitric Acid
Oxalic Acid
Phosphate of Soda
Silicate of Soda
Sulphate of Alumina
Sulphate of Soda, Anhydrous
Sulphite of Soda
Sulphide of Soda
Sulphuric Acid
Tri-Sodium Phosphate

THE GRASSELLI CHEMICAL COMPANY
CLEVELAND *Incorporated* **OHIO**
New York and Export Office: 350 Fifth Avenue

BRANCHES AND WAREHOUSES:

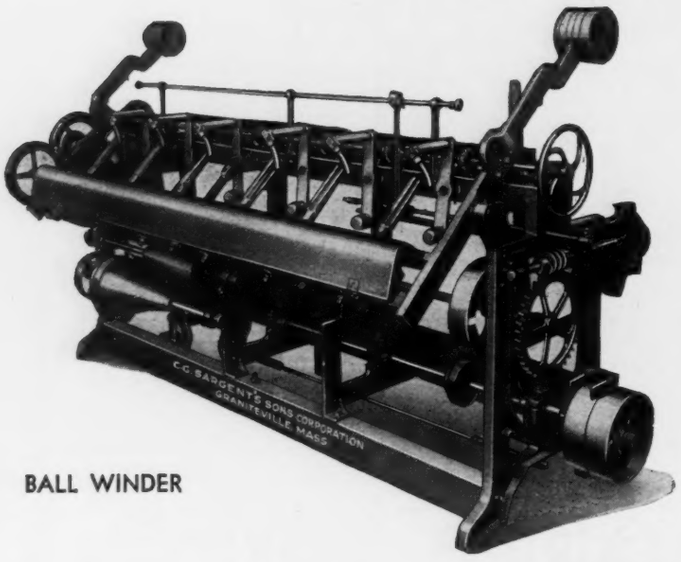
Albany	Charlotte	Detroit	New Orleans	St. Louis
Birmingham	Chicago	Milwaukee	Philadelphia	St. Paul
Boston	Cincinnati	New Haven	Pittsburgh	Sodus, N. Y.

SAN FRANCISCO, 576 Mission St. LOS ANGELES, 2260 E. 15th St.

Represented in Canada by Canadian Industries, Ltd.
Acids & General Chemicals Division . . . Montreal and Toronto

• GRASSELLI GRADE •
A Standard Held High for 93 Years

MARKET CONDITIONS DEMAND FLEXIBILITY



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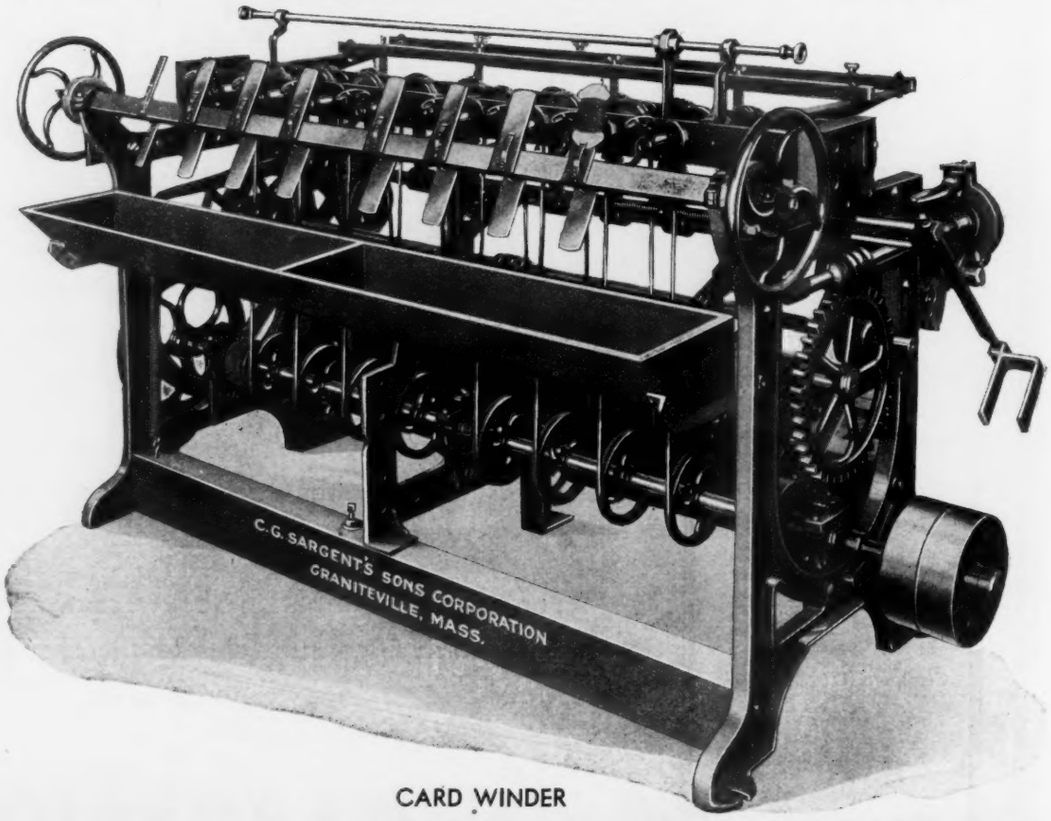
Yarn Conditioning Machines



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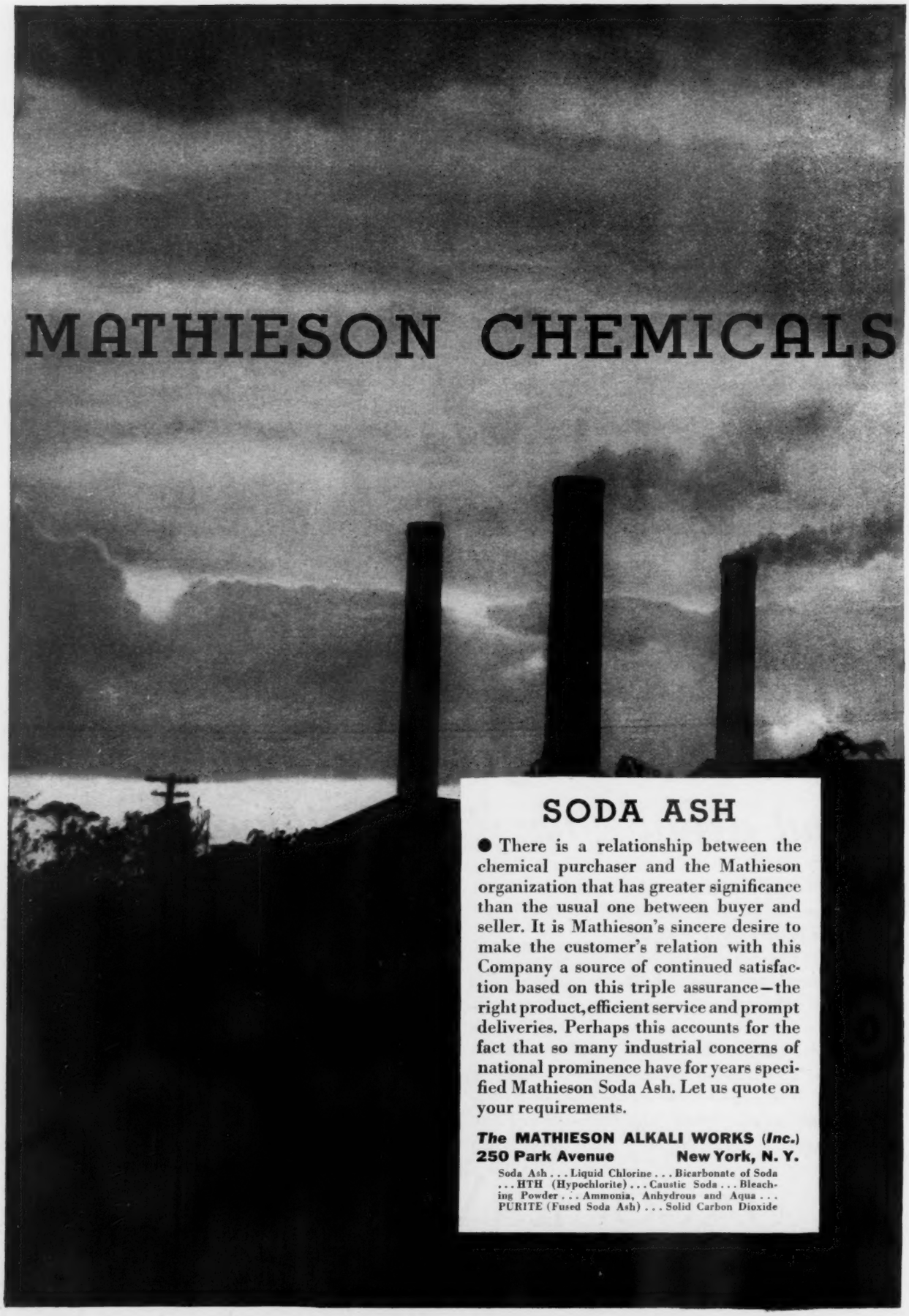

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Vol. 96 **COTTON** No. 12

December, 1932

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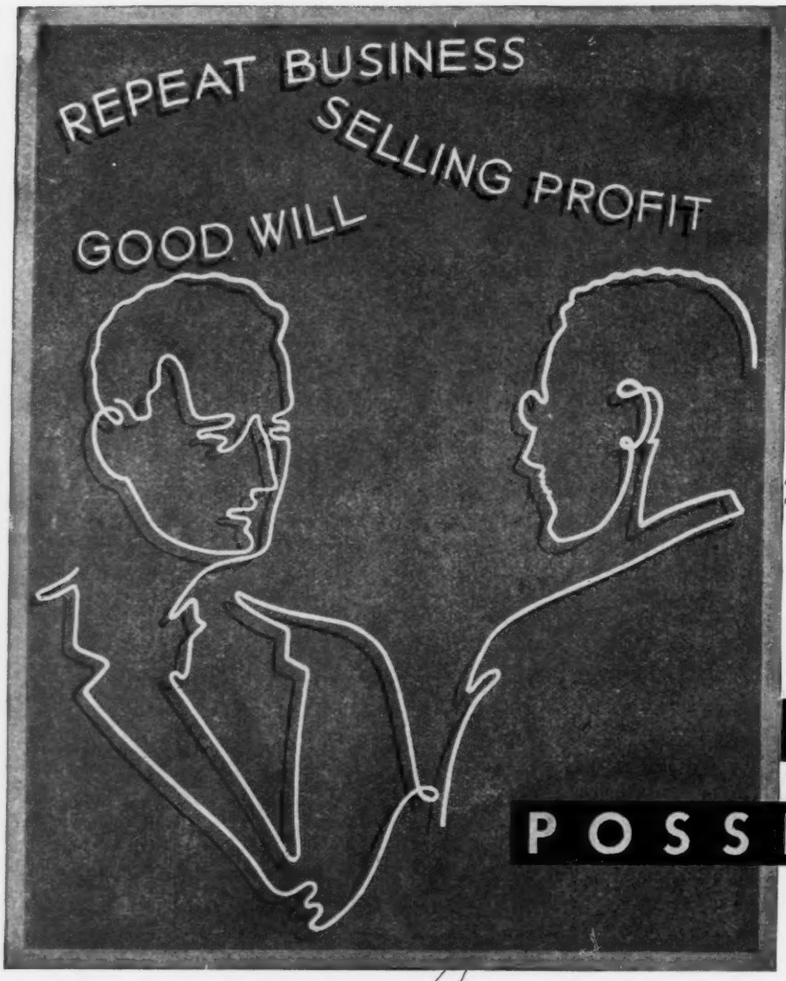

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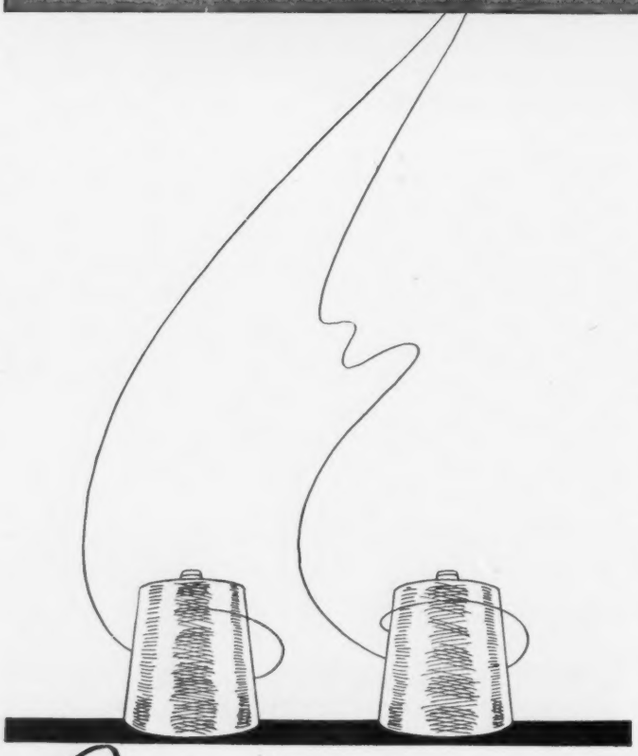
AFTER ALL, it's the way your merchandise sells—the approval it receives and the price it brings—that determines the value of the products you use in making it. ◆ ◆ For you are buying yarns only for their *profit possibilities.* ◆ ◆ How important, then, that quality be always thoroughly uniform and dependable! For this reason PREMIER and SPUN-LO are popular with quality-minded textile manufacturers eager to produce products of outstanding sales appeal and win the better markets.



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Vol. 96
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COTTON

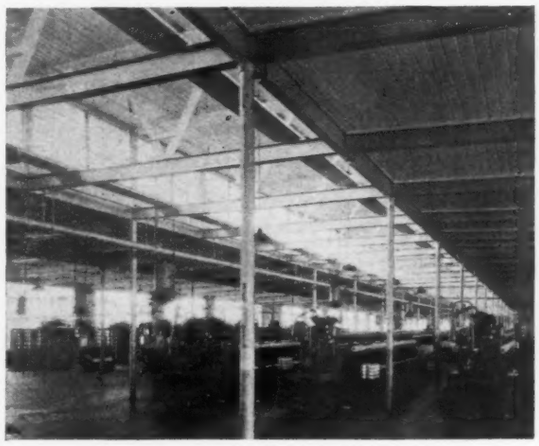
December,
1932

Practical Suggestions on Maintenance of Mill Buildings

By J. C. Edwards
Superintendent, Martha Mills,
Thomaston, Georgia.

THE purpose of this article is to discuss the subject of building maintenance as applied to textile plants. It will deal also with such appurtenances as are commonly considered a part of the building, as well as equipment for the proper maintenance and protection of the building against natural and accidental causes. The matter of properly maintaining the manufacturing equipment has been thoroughly discussed, and I am inclined to believe that concentrated attention upon machinery has caused many of us to overlook the very important problem of maintaining our buildings. I shall preach what I practice, and realize that my practices will not be applicable to all textile plants and organizations, but if the readers get some thoughts which lead to a better realization of the importance of proper and efficient building maintenance, the purpose of this article will have been accomplished.

It will of course be understood that in this article I am not giving a complete record of every single item involved in building maintenance. My main thought is to indicate some of the more common and important items. I feel that this explanation should be clearly understood in order that I might not be accused of incompleteness; if I attempted to cover the entire subject, the article would be too long to publish or to read.



Proper runways make easier the important work of keeping monitor windows clean . . . . . .

A trip through the Carolinas, Georgia, and Alabama gives one a ready picture of the evolution of mill buildings during the past 40 years. Until some 20 years ago, the traditional plain building with an occasional tower two stories above the main building was about the only type considered for a cotton mill. These buildings were usually equipped with wood sash, pine floors, often surface toilets; and no efforts were made toward sanitation and cleanliness inside the mill or out. I remember working in one mill where common lice could often be seen climbing around the walls; and should someone have suggested to the sole owner of that mill that he scrub the floors or spend money to kill the lice which inhabited the walls, he would have thought that person crazy. That once affluent mill owner died a pauper.

In contrast to these conditions, with our modern buildings, which often look more like a college, with daylight construction, steel sash, scientific ventilation, automatic heat control, hardwood floors, etc., one might think that the problem of building maintenance had largely disappeared. To be honest with ourselves, we must confess that some of our superintendents seem to take the attitude that the problem has wholly disappeared, and just let nature take its course until in time the building is in such a condition of disrepair and dilapidation that re-conditioning it has become such an expensive undertaking that it is left undone or else unnecessarily delayed.

Let us assume that we are starting a new mill. One of the first things to look after is the *roofing and monitors*. After each rain, the master mechanic should contact with the overseer in the top story, who should have been instructed to chalk-mark the ceiling when any leak appeared. These leaks should be repaired as soon as the roof is dry enough, and this work should not be completed until every leak is stopped. I have seen these leaks left alone until the ceiling rotted and fell into the room below.

Proper runways should be built into the monitors and so spaced that windows and all spaces can be readily reached for cleaning. Monitor windows require more washing than side wall windows, however, they should be kept clean at all times. We use a small device made with a water reservoir and squeegee,

which will pay for itself in a few hours of work cleaning windows. Certainly all of us know the value of keeping windows clean, but some of us do nothing about it. Light rays will not filter through dirty windows, and light is most essential to the well organized mill. Also, clean windows have an elevating effect upon everyone in the plant. All monitors made of wood, and having wooden sash, and transoms, should be inspected frequently to see that no glass is loose.

Lighting. Engineers often fail to locate electric lights to the best advantage, in view of subsequent developments and changes especially. Every department in the mill should be studied as an individual problem and the lights re-arranged and additional lights put in where needed. Few mills are built in which some valuable changes cannot be made in the lighting system. Any of the electrical manufacturers will be glad to give assistance, but the average superintendent can solve the problem usually. It may require a higher powered lamp or a different type of lamp or reflector.

In this connection, the brick walls and floor beams, if of steel, should have been painted with a good grade of paint, which is known to be of long life and which reflects light rays without glare. Aluminum paint is coming more into use for inside metal work as well as outside. It works well with a brush or spray gun, is easily cleaned when soiled, and "stays put" surprisingly well. Care should be taken to get the correct type for the job in hand. Of course, ceilings should be left unpainted for at least a year to season out in order to avoid dry rot.

Courtesy, Finnell Systems, Inc.

"Three men with the proper scrubbing equipment can cover 85,000 square feet in ten hours" . . .

Keeping the Floors Clean.

Floors. After the mill has been in operation for three or four months, na l-heads will have worked up above the surface, causing considerable trouble, especially around cards, drawing, and slubbers, where drawing cans are dragged on the floor. The nail-heads should be driven in and a punch used to counter-sink them below the surface where they will stay always.

A special waterproof material should be used on and around the ends of all floor boards. Here is almost invariably where the floor begins giving away, especially when wet and trucks with small iron wheels run over them.

Often floor boards will warp at the ends and raise up. These should be replaced or planed off level. Remember that any roughness in the floor will give constant trouble to someone and should be corrected. A good northern maple floor well put down will last indefinitely. But I have had some sad experiences where beech or southern maple was shipped by mistake or purposely. This flooring is hard to detect while new but will be badly worn and splintered within two years. Flooring should be bought only from reputable dealers.

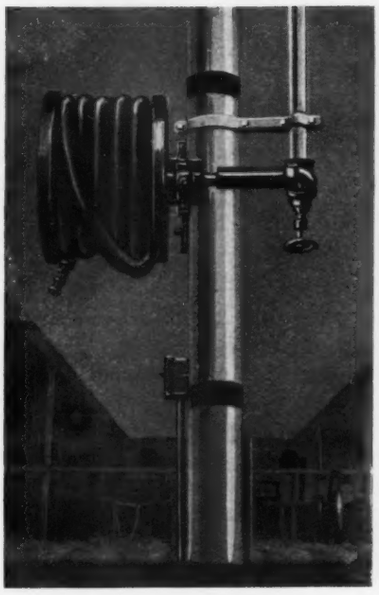
Scrubbing. Keeping the floors clean and sanitary requires thought and system. A man should keep on experimenting until he finds the best soap. I use a powder that dissolves in the water supply tank of my scrubbing machine, thereby saving the time of a man for spreading the powder. By all means, use a scrubbing machine. If the floor is rather rough, a longer, more flexible brush can be secured that will get into the low places and do the job. Also, if the floors are not water-tight, the water supply can be so controlled that there will be no trouble with leakage to lower floors. Three men with the proper equipment make a good working crew and can cover 85,000 square feet around spinning, fly frames, in a 10-hour day. One of my scrubbers follows the other two with a dry mop, and with more than 1,100 operatives we have not had an accident from slick floors in more than two years.

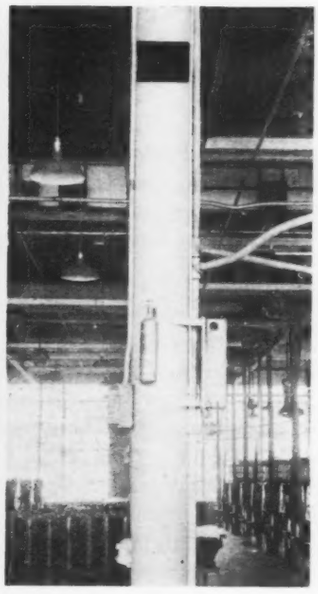
Getting the floor dry after scrubbing is just as important as scrubbing; where the floor is water tight, rinsing water should be freely used.

In this connection, the floors should be kept as clear as possible of all obstructions, such as work benches, bobbin bins, stools, etc. These things are constantly in the way of traffic as well as being hard for scrubbers and sweepers to keep cleaned around. Sufficient movable trucks, instead of the usual fixed bins, should be provided for surplus bobbins, and suitable seats to fasten onto the machinery can be procured from the machinery builders. Second hands, section men, etc., should be instructed to co-operate fully with the scrubbers and help to move trucks and benches out of the way. The operatives also can be of great assistance if they are not allowed to spit on the floor and are required to keep black oil, etc., off. Other scrubbers than the regular floor crew should take care of cleaning windows. toilets, stairways, etc. I find negro men preferable to women as scrubbers.

Fire prevention and fire fighting may be properly considered as a part of the mill maintenance program. Sprinkler, humidifier, drinking water, conduit and air pipes should be painted in different colors throughout the mill so that they are readily recognized whenever seen. All valves in the sprinkler lines should be numbered, and all section men, second hands and overseers should be familiar with the

valves in their departments and be instructed as to what to do in case of fire or other accident. I even have our master mechanic go all through our system, even out into the mill yard, with all of the department heads and see that all of them understand the location of all valves and what they control. Practically all fires are in the picking and opener rooms. These are generally near the cards and drawing where help can leave their jobs for a few minutes.





At left, reel of garden hose for fire-fighting, equipment in every department, and switch used in opening and picking; note stripes on this post, and on fire gun post in spinning room, at right, to make their location easily seen by operatives . . .

We have a signal system from the picking and opening rooms which calls grinders and drawing operators to the picking and opening rooms in case of fire. Also the scrubbers go there immediately for the purpose of taking water off the floor and caring for burned cotton.

Rules and Equipment for Fire-Fighting.

Fire Fighting Equipment. We rely largely upon the small carbon tetrachloride guns. When these do not suffice we resort to water hose. We have a number of small home-made reels made in our shop and located at strategic points on posts or walls throughout the picking and opening rooms. These reels carry 50 feet of common ¾-inch garden hose each, and regular adjustable nozzles, and are much better than the hose usually used for this purpose. These hose are always connected through a water tight packing joint, and turning a convenient valve gives a ready supply of water instantly, which can be controlled as a fine spray or a solid stream by a turn of the nozzle.

Refined carbon tetrachloride is preferable to water or soda and acid guns. Do not use any liquid in these guns not recommended by the manufacturer of the particular type of gun. We keep our guns well scattered throughout the mill where most needed. A record of each serial number is kept so that they may be identified if stolen and a red band is painted well up on the post where the guns are located so that in case of a fire anyone knows at a glance where to get a fire gun.

The greatest advantage in fire-fighting is in getting after it at the earliest possible moment. We have a system of small button switches scattered over our opener and picker room so that our men are always near one of them. Merely striking any one of these switches stops all feeds and cotton right where it is, but does not stop the fans to the dust house. This system was worked out by ourselves at a very small cost and is very valuable to us.

A special box fitted with extra sprinkler heads and wrench for changing them is kept near the machine shop door, and when a fire signal sounds, the first shop man out of the door grabs the box and is ready for the job of replacing any fusible links which may have gone out. Section men all over the plant are charged with the responsibility of inspecting each day all fire guns on their jobs, seeing that they are in place and full. After a fire all guns and other fire-fighting equipment are immediately put in first-class shape and replaced, for one can never tell what minute another fire will break out.

Inspection. We have a regular form which the weekly inspector carries with him on all of his weekly inspections. This form has each valve and valve number on it and spaces for all other points of inspection, and also calls for comments and suggestions by the inspector. We do not depend on the inspector to see everything needing attention. In my rounds over the plant I make notes of such things as leaky air valves, loose flooring, rotting flooring, dirty stairways and toilets, and any place which needs painting, etc., and turn this list over to the master mechanic, later checking up to see that they have been taken care of.

We work our painters over week-ends, having made notes of all places needing touching up, such as posts, toilets, walls or stairways, and find there is always something to be done to keep the mill looking well. You will note that we have no elaborate system of inspection, but I, with the master mechanic, can find plenty. We occasionally go over the plant together—even over the roof, pent houses and monitors, and keep up with the smallest details and in this way avoid having any costly repair jobs.

Do not put eye bolts through ceiling. Leaks are hard to stop in a built-up roof. Go over the bolts and nuts in the frame work after the building has settled and tighten them all up good. This is especially necessary where steel framing is used. Any cracks in brick walls and concrete walks should be promptly filled to keep out water and frost, thus preventing further deterioration.

Standard Methods of Working vs.

THERE is always a "one best way" of performing any kind of job. Standard methods benefit the worker and employer alike. Management must determine the proper method and insist on its general adoption for the good of all . . . . .

EVERY man who has an acquaintance with military matters knows the thorough study that is given to the routing or "serving" each piece of artillery, large or small.

The precise method of making every movement is considered until that method which gives the greatest sureness combined with the highest speed, is determined. Then, gun crews are schooled in that most effective method. Individual preferences for other methods are set aside in adhering to the "one best way".

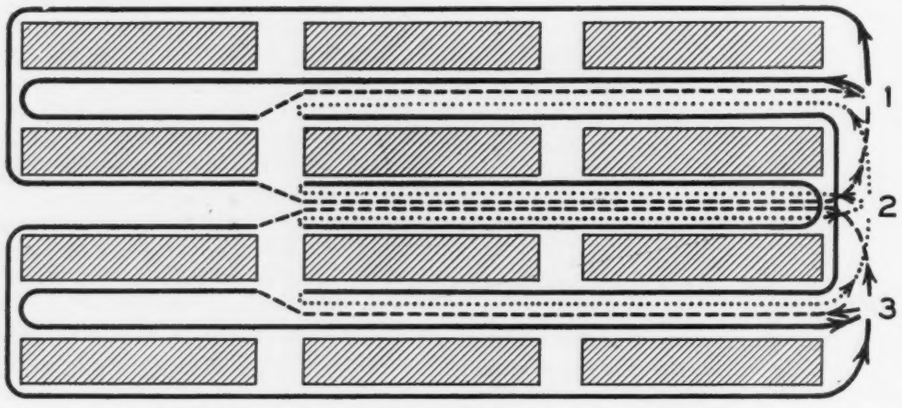
The "one best way" is a factor of no less importance in the routines of industry than it is in military success. Obviously, it is unprofitable to employ in industrial activity any frequently repeated method other than the way which takes the least time to give the desired result. In most cases that method which is most advantageous may be readily found, and with firm insistence, readily put into successful use.

It is seldom true that workers think out and employ the *best* methods of working. This applies equally to long experienced workers and to beginners. The first method learned, whether self-taught or learned from another person, is too often used thereafter with little or no change. It is an exceptional worker, even among piece workers, who earnestly studies his methods, and among these only a few evolve what can rightly be termed a "best way".

The plea that individuals may, of right, choose their own method of working, is without justification. The right of the employer to have work done in the most advantageous manner is paramount, and in this basic right the employer represents also the rights of the employees taken as a whole, against any single individual. A state of anarchy would be the logical outcome in any business by deferring to the alleged rights of individuals to perform their tasks as they please.

To illustrate the benefits of determining and employing the "one best way", let us take the operation of doffing as performed in one mill before a study was made. As shown in Fig. 1, three trips were required for the doffing of 24 sides on 12 frames. Individual methods of performance differed widely. The time differed as widely as did the method of working. Some hands showed much skill, but were slow because of poor methods. The extreme between good and poor performance ranged up to three times the best averages.

Time losses cumulated for the year amounted to a formidable total, far more than it cost to firmly establish the best practice in doffing, shown in Fig. 2,, which required only two trips to do what formerly took three trips. Not alone doffing, but every other operation in this mill that was frequently repeated, was placed on the basis of the "one best way".



BEFORE STUDY: THREE TRIPS TO DOFF 12 FRAMES

To establish this "one best way" for any work requires the:

(1) Determination of the best method.
(2) Teaching the workers the method decided upon.
(3) Enforcing the continued use of the best method.

The matter of teaching the methods to workers is vitally important. Not all in authority as second hands are good at teaching, nor can they properly spare time from other duties for adequate instruction of a roomful of subordinates. Highly skilled workers are not necessarily good teachers. Teaching requires certain peculiar qualifications that are not

Individual Preference

--By--
C. F. Scribner, M. E.

usually found among factory workers. Suggestions for teaching workers better ways of doing their work should be outlined and placed in the hands of all those who may be called upon to perform this task.

The matter of subsequent enforcement of approved operating regulations, after these are definitely decided upon and formulated in writing, involves their proper communication to overseers and second hands, and to the workers concerned. The responsibility for this is executive.

The method found best has been to furnish all operating instructions, but general and special, in writing. Reference copies for filing are needed by overseers and second hands, so that they may at any future time refer to them and refresh their memory. Failure to provide written instructions and orders will inevitably result in mistakes due to inability to remember accurately. Expecting perfect memory is expecting the impossible. New instructions affecting workers should be posted in writing until all are familiar with them. Some of these instructions may, of course, be posted permanently.

Written instructions which are established under the authority of the mill executive should be issued in writing from the mill office, not from department offices. All copies that are needed should be furnished, including all that may be required in connection with the teaching and training of the workers.

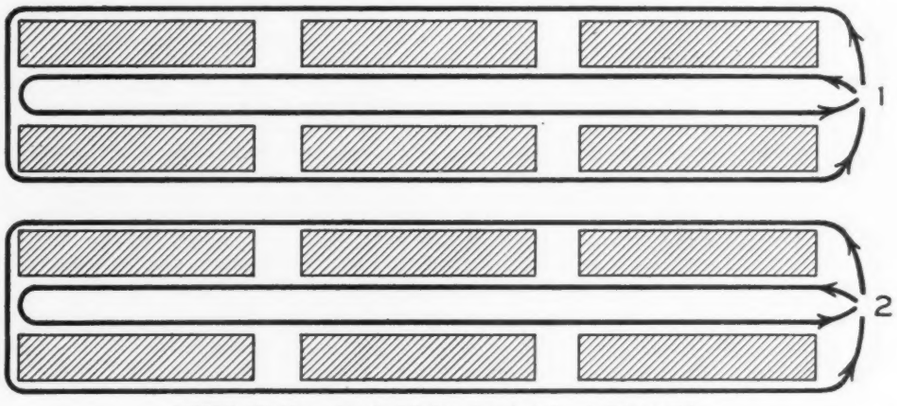
It is less difficult to formulate and convey instructions than to insure that sub-executives will not only initiate but continue their enforcement. This is clearly a responsibility of the overseer who, as a loyal member of the mill executive staff, cannot do otherwise than enforce, in their true spirit, all poiicies, purposes and specific regulations which are sponsored by the mill management.

The first step in this direction is for overseers to have a clear understanding of the intent back of each order or regulation, including those which relate to methods of working. The second step is to know, not merely to guess, that second hands under their authority understand rightly, and that interpretations are uniform.

Doubtful points should be referred to the superintendent to be construed authoritatively. He may delegate someone to act for him in matters of methods and teaching, but the authority will still be his. The necessity for clearing away doubts as to interpretations is, however, most likely to be first known to overseers.

The third step toward enforcement is in securing the right understanding on the part of workers. Responsibility for this rests directly with the second hands, but overseers are not relieved of their responsibility and the need to verify the attainment of full understanding on the workers' part. With the groundwork of understanding laid, the actual work of enforcement begins, and in this the overseers are wholly responsible in all cases except when workers are to be taught individually. In such cases responsibility lies with the second hands, while overseers must apply the follow-up.

"Check-ups" by both overseers and second hands, at such intervals as the nature of each case requires, are necessary to assure enforcement. This may take the form of questioning, or mere observation may be sufficient. Taking it for granted that the problem is ended because the "one best way" has been determined and instructions have been issued, is not enough. To stop with this is to fail. The desired results will slacken or cease when enforcement is relaxed. Enforcement implies positive and persistent action, for which the overseers alone are directly responsible.



AFTER STUDY: TWO TRIPS TO DOFF 12 FRAMES

Driving workers to an increased production and a lesser pay, should have no place in mill management. The study which precedes the determination of the "one best way" must make the work easier and less fatiguing for the workers, and must give to them the opportunity for increasing their earnings in proportion to their efforts. When these conditions are brought about, opposition is replaced by hearty co-operation and individualism is replaced by the "one best way", satisfactory to all.

The Importance of Cotton Classing and Grading at the Mill

By H. H. Willis, Director

Textile Department, Clemson College

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THIS article points out the importance of proper classing and grading by the mill's cotton man, and, therefore, the importance and value of a good cotton man. It also gives in a clear manner a description of grade; length, strength and uniformity of staple; and character, and the several elements of each of these factors. It will pay the executive to study this discussion and see that his men do likewise . . . . .

COTTON classing is an art. However, if the cotton classer is to be of real value to the mill, he must be much more than merely a good grader and stapler. To a considerable degree his value to the organization is determined by his ability to act in an advisory capacity in the selecting of cotton for given purposes. In addition to his wide experience in cotton classing, he should have a fair working knowledge of what takes place in cotton manufacturing and broad general information as to the spinning qualities of different varieties of cotton and where they are grown. For instance, he should know not only that different varieties of cotton grown in different sections of the cotton belt, although similar in grade, staple and general character, have different drafting and spinning properties, but he should also know how and to what extent they differ; at least he should be thus informed about the better known varieties. He should know roughly the kinds and amounts of waste removed by the cleaning machines from the respective grades of cotton. He should know the importance of proper blending and mixing. When the management considers a change in the grade or variety of cotton which it is using, the classer should be able to furnish information as to the spinning characteristics of the grade or variety under consideration before the costly process of changing over is effected. In case he does not have such information, he should co-operate with the overseers and superintendents in having a reasonable spinning test made. Whenever a change in raw stock is made either in grade, character or ratio of mix, the classer should advise the card room overseer so that he may be on the lookout and make necessary changes and adjustments in order that the yarn numbers may remain as nearly constant as possible and that the general quality of the work may not suffer.

In order better to understand the ways in which the cotton classer can be of value to the mill, let us consider some of the factors which influence the spinning quality of cotton.

The U. S. Department of Agriculture has set up standards for grade and staple. Guided by these standards, the classer considers primarily three factors which, to a large degree, determine the quality of the yarns spun. These factors are grade; length, strength and uniformity of staple; and character. Grade of cotton is determined largely by color, amount and kind of foreign matter, and preparation.

Grade

Color: Although a somewhat negligible factor in some cases, color is a very important factor in manufacturing fabrics or yarns for certain specific requirements. In the so-called nine white grades, the low grades carry a small amount of blue or gray and neither bleach nor take dyes in certain shades as satisfactorily as do the higher grades. This is an important point to consider in manufacturing goods to be dyed in very light shades. If the mixing and blending of the lower and higher grades is not uniformly done, streaked goods may result. Although such streaks may not show up in the gray or natural finish, they often appear in the finished product. Thus if the mill is mixing several grades of cotton, it is im-

Item	Name or Grade Number								
Grade Name	Middling Fair	Strict Good Middling	Good Middling	Strict Middling	Middling	Strict Low Middling	Low Middling	Strict Good Ordinary	Good Ordinary
Grade Number	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9
Per Cent Waste	5.50	5.49	6.02	6.26	7.49	8.08	10.36	11.86	14.44

Table 1.—Percentage of total visible waste from pickers and cards for each of the nine white grades.[1]

[1]See main footnote number one

portant that the cotton classer know the finishing quality of the respective cottons in order to set up the right ratio of mixture for the overseer of carding whose duty it is to see that the different bales are blended properly.

Foreign matter: The next factor in grade, that of foreign matter, consists mainly of leaf trash, sand and aborted seed. The kinds and amounts of such waste material depend to a large extent upon the weather conditions during the harvesting season and the manner of picking, cleaning and ginning. The different grades carry different amounts of waste, the lower grades, generally speaking, carrying a higher

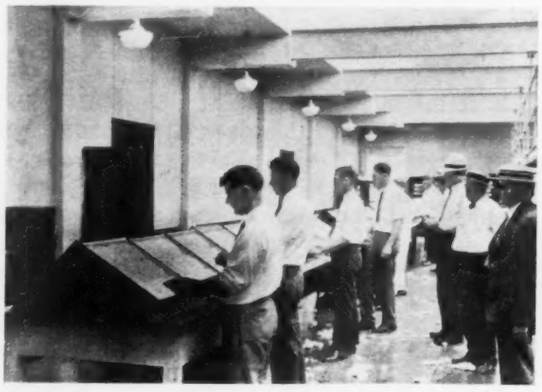


Fig. 1. A view of the cotton classing room, Cotton Division, U. S. Department of Agriculture, Washington, D. C. All government standards for grades and staples are made up by this department. Note the well lighted room. Overhead north light is recommended for accurate classing. . . . .

per cent of waste than do the higher grades. Figure 3 shows a graph of the amounts of total visible waste removed from the nine white grades in a series of tests. In the processing of cotton, short fiber as well as foreign matter is removed as waste. The amount of total visible waste for the nine white grades from high to low usually ranges from approximately 5½ to 15 per cent.[1] (See Table 1). Of course, individual bales or mixes of two or more bales of the same grade may vary somewhat from the amounts shown in Table 1 depending upon the relative weight given to color and to preparation in classing the cotton. To illustrate: A bale of cotton classed as Strict Middling, No. 4, may be Middling or No. 5 with respect to foreign matter and Strict Good Middling or No. 2 with respect to color. In such a case waste would probably run a little higher than the average for grade 4. The amount of short fiber removed from the cotton also influences the total amount of waste. For instance, one bale of cotton may have from one to two per cent more short fiber than another bale of the same grade. The amount of such short fiber in the respective grades depends somewhat upon the variety of cotton and the place in which it is grown. The percentage of waste is, of course, of prime importance to any mill regardless of the kind of yarn or fabric it is making, for waste represents a loss in that the greater the amount of waste per bale, the less the amount of spinnable cotton per bale. This loss is offset in part, however, by the sale of waste. The classer can be of considerable aid to the mill if he knows where varieties of cotton with low percentages of short fiber are grown.

Preparation: The third factor, that of preparation, is determined largely by ginning and the condition of the cotton at the time of ginning.[2] Preparation is, of course, of more importance to mills which are making fine goods than to those on coarser goods. Many of the fine neps or tangled fibers caused by poor preparation are not removed in the picking and carding processes. When these are spun into the yarn, a rough appearance results, and market value is reduced accordingly.

Length, Strength and Uniformity of Staple

It is very important that the staple being used by the mill be as uniform in length as possible. Care should be taken to select bales not only of the same grade and staple but of corresponding uniformity in fiber length. To illustrate: Two cottons may be

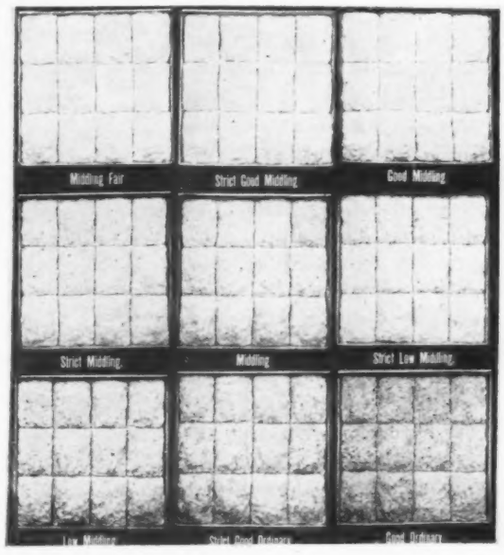


Fig. 2. A view of the nine white grades of cotton ranging from No. 1, Middling Fair, to No. 9, Good Ordinary. Note the gradual increase in trash from high to low grade . .

classed as 1-inch staple. However, one may have many more short fibers than the other. These short fibers serve only as a filler and do not contribute their share to the strength of the yarn.[3] Special attention should be given to the mixing and blending of bales because two bales of the same staple do not necessarily produce yarns of the same strength. It is entirely possible for two bales classed as similar in grade, staple and character to produce 22s yarn, the average yarn strength of which may vary as much as 15 pounds. The writer has tested groups of such similar bales, each group being representative of a different staple, and has found that 22s yarn varied between bales as much as 10 to 15 pounds. This variation is

[1] H. H. Willis, "Manufacturing Tests of Cotton of the White Grades of the Universal Standards for American Cotton," U. S. Department of Agriculture Bulletin 1488, April, 1927.

[2] H. H. Willis, "The Relation of Ginning to the Spinning Quality of Cotton," January, 1932, COTTON.

[3] H. H. Willis, "Spinning Quality of Some Cottons Grown in the South Atlantic States," May, 1927, COTTON.

due largely to the variety of the cotton, and the conditions under which it was grown. Such factors as staple length, strength and uniformity are presumably varietal characteristics and are influenced by the type of soil and by the cultural and weather conditions under which the cotton was produced.

The writer has tested 1 1/8-inch staple, grown in different sections of the cotton belt from the same seed source, which varied considerably in strength and in waste content, the difference in waste being largely a difference in the amounts of short fiber. This, of course, illustrates the effect of growing and ginning conditions. Such a difference is significant both from the standpoint of waste and from that of yarn strength and uniformity. In some instances certain varieties of 7/8-inch staple grown in a given section have produced 22s yarn equal in strength to that of yarns spun from 1-1/16-inch cotton grown in other sections of the cotton belt. It is, therefore, very important for the cotton classer to have some knowledge of where these better cottons are being grown. The U. S. Bureau of Plant Industry and state experiment stations during the past few years have done considerable valuable work in the development of better varieties of cotton, some of which are being produced on a one variety, community basis, that is, only one kind of cotton being grown in a given district. This community plan prevents a mixture of cottons either by means of cross fertilization or by mixture of seed at the gin. It is the writer's opinion that it would pay the larger mill or chain of mills to carry on its staff a specialist in cotton production and manufacturing whose duty it would be to inspect the cotton during the growing season with a view to selecting the raw stock from those localities which are giving special attention to the production of better cottons.

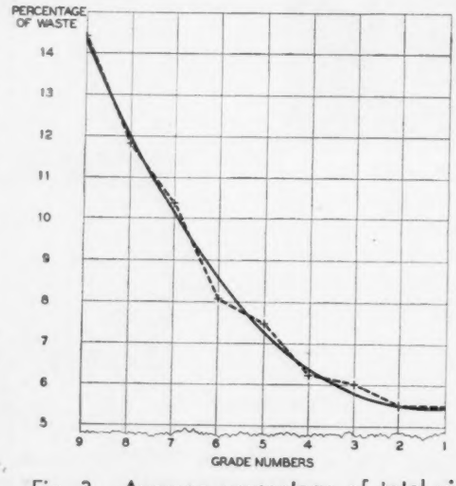


Fig. 3. Average percentage of total visible waste from eastern and western cotton of each of the nine grades . . . . .

The crosses on the dash line indicate the actual percentages of waste removed in the test, while the solid-line curve is the best representative line. (See main foot-note No. 1.) . . . . . .

Generally speaking, the higher grade cottons produce slightly stronger yarn than the lower grades. This is not necessarily true in a one or two bale mix, but does hold true on the average of a large number of bales; hence, the importance of proper mixing and blending in order to insure uniformity of product and smooth running work. A practical illustration along this line may prove of value. In a recent talk with a superintendent in regard to cotton classing he stated that on one occasion when he took charge of a card room he found the work running most unsatisfactorily, the spinners being kept busy with only from six to eight sides when they should have had almost twice that number. He undertook to locate the trouble. Finally he traced the difficulty to its source. Bales of cotton were being brought from the stock room without regard for grade or staple and the man in charge of the opening room was using no particular system in mixing these bales; in fact, he was not mixing them at all. In other words, he was feeding from one bale until that bale was consumed and then he would start on another. As has been shown, it was possible to have a difference of as much as 15 pounds in strength between the yarns of any two bales thus fed. The first action of this superintendent was to have an expert classer go over his entire stock and assort it according to grade and staple. He then laid out an organization for mixing and blending some 15 to 20 bales for each day's run. A short time after he had adopted this particular system, the running of the work improved to such an extent that a number of his spinners were able to run from 12 to 14 sides instead of from six to eight.

Another case: A superintendent, upon taking charge of a mill, found that a mix of three types and lengths of cotton was being used. Since he realized that the care or lack of care exercised by the opening room is responsible for the degree of uniformity attained by such a mix, he decided to eliminate, insofar as possible, this variable. Instead of mixing three types, he determined the average of the three staples and grades being used and bought a single type which corresponded to the average of the three types previously used. With the elimination of the mixing of the three kinds he found that the running of the work improved considerably. There may be some advantage in mixing different grades and staples. However, the possibilities for errors and poor running work are more numerous when using such a mix than when using a standard type properly blended. The work of the classer is fundamental. Intelligent co-operation between cotton classer, cotton buyer and the heads of the various departments will go far toward insuring smooth running work.

Character

The term character in cotton is a more or less general term which covers a number of fiber characteristics which have not as yet been reduced to measurement. Cotton is usually divided into three main groups in respect to character, namely, soft, normal and hard. Cotton characterized as soft is commonly used in soft twist yarns. The others are used for yarns with more twist.

It is usually assumed that soft cotton produces weaker yarn than hard cotton. This is not necessarily true. The writer has tested soft, normal and hard cottons in various staple lengths and has found that single bales of some cottons classed as soft produced yarns as strong as those spun from normal and hard cottons of similar grade and staple. Furthermore, one test lot classed as very soft, when spun into 50s, 60s

and 70s combed yarn with a draft as high as 16 on ordinary spinning, produced yarn equal to the new Draper standard.[4]

Importance of Proper Blending and Mixing

The mill is interested primarily in the manufacture of a product of uniform standard strength. The attainment of such uniformity depends largely upon the ability of the cotton classer to select the cotton and upon the method of mixing and blending adopted in the opening room. By properly blending and mixing cotton which has been uniformly selected for a given staple, grade and character much of this variation among bales is neutralized. To check on this particular point the writer tested three bales of cotton separately and found 14 pounds variation among them.

BLUE STAINED	GRAY	STANDARDS FOR GRADES OF UPLAND COTTON WHITE	EXTRA WHITE	SPOTTED	YELLOW TINGED	LIGHT STAINED	YELLOW STAINED
		1 OR M.F.					
		2 OR S.G.M.			*2 T.*		
3 B.	*3 G.*	3 OR G.M.	3 G.M.	*3 SP.*	3 T.	*3 L.S.*	3 S.
4 B.	*4 G.*	4 OR S.M.	4 ST.M.	*4 SP.*	4 T.	*4 L.S.*	4 S.
5 B.	*5 G.*	5 OR M.	5 M.	*5 SP.*	5 T.	*5 L.S.*	5 S.
		6 OR S.L.M.	6 ST.L.M.	*6 SP.*	6 T.		
		7 OR L.M.	7 L.M.	*7 SP.*	7 T.		
		8 OR S.G.O.					
		9 OR G.O.					

Note: In Fig. 4, Symbols in heavy type denote grades and colors for which practical forms of the official cotton standards are prepared. For the grades indicated by symbols in italics no practical forms will be furnished. Gray cotton is between the White and the Blue Stained in color, Spotted between the White and the Yellow Tinged, and Light Stained between Yellow Tinged and Yellow Stained. The grades shown above the horizontal lines are deliverable on future contracts made in accordance with section 5 of the U. S. cotton future act. Those below the line are untenderable on such contracts. (United States Department of Agriculture Service and Regulatory Announcements No. 92.)

Fig. 4. Grades and colors of the universal standards for American upland cotton . . . . . .

These three bales were then thoroughly mixed in the same ratio and spun into yarns, the average strength of which was approximately equal to that of the average of the three lots of yarn spun from the three separate bales. These results indicate the importance of the proper mixing and blending of cotton in order to approach uniformity in the strength of the yarn spun.

Immediate Monetary Difference Between Grades

Frequently a mill organization using a particular grade or staple of cotton feels that it may prove advantageous to change to a different grade on account of the difference in the price of the raw product. In making such a change, considerable thought should be given to the immediate monetary difference between these grades. In order to determine this difference, it is necessary to consider not only the difference in the market price of the two cottons but also the difference in the amounts of waste which the two cottons may carry, comparative machine hour costs and the general running qualities which, of course, influence the amount of production and also the cost per pound. In general, the lower grades carry more waste and thus it is necessary to clean the machines more often and to grind the cards more frequently.[5] It takes just as long to put 100 pounds of low grade cotton through the cards as it does 100 pounds of high grade. Yet, in the case of the high grade, probably 94 pounds of sliver would be produced as compared with possibly 91 pounds of sliver for the low grade. It is very possible for the higher machine hour costs of manufacturing low grade cotton to offset the saving effected in the price of the raw stock.

Universal Standards for American Upland Cotton

In order to give the reader some idea of the number of grades and colors of cotton, Figure 4 has been included.

The white standards from one to nine may be considered the center around which the others are grouped. Middling or No. 5 is the basis on which all grades are bought and sold, prices being quoted as so many points on or off Middling. The numbers in the various columns are grade numbers; for instance, in the column Yellow Tinged, 3 T. indicates grade No. 3, Good Middling Tinged.

There are other differences among varieties which should be considered when selecting cotton for a given requirement. For instance, different varieties of cotton grown in different sections of the cotton belt draft differently. In the writer's experience he has found cottons similar in grade and staple though different in variety which drafted very differently on the drawing and fly frames. Frequently this difference in drafting property makes it necessary to change the draft gear by one to two teeth. Different varieties of cotton also take up different amounts of regain although worked under the same relative humidity. The writer has seen two varieties manufactured under the same humidity conditions which differed in regain as much as 1.5 per cent.[6] Thus, it is very important for the cotton classer to know and to study the kinds of cotton from the different sections of the cotton belt and to have a working knowledge of their physical properties, so that he may advise the management intelligently in regard to changing from one type of cotton to another and also let the overseer of carding know what to expect when the change is made.

A wide-awake and progressive cotton classer can be worth at least as much to a mill as the best superintendent. It is he who lays the foundation for uniformity of product and smooth running work.

[4] H. H. Willis, "Spinning Tests of Leading Varieties of South Carolina Cottons (Crop of 1925)," U. S. Department of Agriculture Preliminary Report, December, 1926.

[5] See Footnote 1.

[6] H. H. Willis, "Importance of Cotton Regain and Its Control," July, 1931, COTTON.

Competition Takes Its Toll

By E. G. Field

Wm. H. James and Associates.

COMPETITION of the free and open variety has been considered a business condition that was generally desirable for the benefit of both the consumer and the producer. When the wants could not be filled as fast as the desires were created, and business was expanding to meet a further growing demand for products, then it was that competition did help to attract the additional plant facilities that were necessary and in turn helped to reduce prices so as to create a still wider market.

The cotton-textile industry has been through this period of expansion to meet the public needs. That period was followed by a movement of the equipment to relocate for competitive price advantage. In recent years the industry has experienced a strong competition between the many units, as some have sought more than their respective shares of the available business in order that certain mills may operate at capacities much higher than could be available to the entire industry.

Table I—Growth of Cotton Spinning in the U. S.

	Spindles in Place		Population	
Year	Number (Thousands)	Percent	Number (Thousands)	Percent
1910	28,929	100	91,972	100
1920	35,834	124	105,711	115
1921	36,618	127	—	—
1922	36,946	128	—	—
1923	37,409	129	—	—
1924	37,804	131	—	—
1925	37,929	131	—	—
1926	37,586	130	—	—
1927	36,696	127	—	—
1928	35,540	123	—	—
1929	34,820	120	—	—
1930	34,025	118	122,775	133
1931	32,673	113	—	—

The last movement has not served to develop any additional business for the industry. In fact there have been developed other competitive lines that have taken work away from the cotton-textile plants.

The first period, that of growth, was clearly marked by the building of plants and is shown in Table I by the increase in the number of spindles in this country.

Since the year 1925 the industry has shown a continuous decline in the number of cotton spinning spindles in place.

The second period, that of relocation for economic advantage, resulted in a competition between sections of the country and was made possible by the improvements in mechanical arrangements both for machines and for control of desirable conditions that permitted advantage to be taken of available labor and facilities and of freedom from legislative restrictions as offered by the South. It was therefore natural that the mills were moved to the Cotton Growing States. This relocation period has extended over many years, as shown in Table 2.

From the tabulation in Table 2, it is noticeable that in 1928 a majority of the spindles had been located in the South and the proportion has expanded through the last statistics that showed 58 per cent in 1931. That there were decided economic advantages to the southern mills is told by the proportion of spindles that were active, starting with a majority in 1926 and reaching 62 per cent in 1931. At which time the southern mills were running 74 per cent of the spindle hours and did consume 79% of the cotton used by the mills in this country.

This growth of the industry in the South has in many ways been remarkable. But today it stands out conspicuously in that the Cotton Growing States have such a predominate part in the manufacture of cotton into goods for consumers. The relation of the planter and manufacturer are closer than ever before. In July 1932 the South ran 84 per cent of the spindle hours. Is it possible for these southern mills to adopt joint management policies that will make the South prosperous? Otherwise, these mills must further continue the competition in order to damage each other in a manner of injury to the South. Few people seem to realize what an opportunity is now presented for the mills to work together through their local associations.

Table 2—Spinning in Cotton Growing States relative to Total in the United States

Year	Spindles In Place	Active Spindles	Spindle Hours Run	Bales Consumed
1922	43%	44%	55%	63%
1923	44	45	56	64
1924	45	47	62	68
1925	46	49	61	68
1926	47	50	63	70
1927	49	52	65	72
1928	52	54	69	75
1929	54	57	69	76
1930	56	59	72	78
1931	58%	62%	74%	79%

The cotton-textile industry reached its maximum growth in 1925 and it is noticeable that by 1924 there had been started a distinct downward trend in the proportion of spindles being left in competition. This trend is brought out in Table 3 showing the activity of the total industry:

The force of competition has produced such low prices for goods that many spindles were forced to withdraw from the market, until in July there were only 62 per cent of the spindles that attempted to operate, and these spindles did average to run at 83 percent capacity, although the entire industry only averaged 52 per cent of the full single shift capacity in place.

While there was general curtailment, that condi-

tion was also known to the purchaser of cloth, who found that the mills were individually in competition with each other to see who could obtain the orders that would necessitate running more hours. The extent of loss to the mills can not be readily determined but it certainly was noticeable how the selling prices dropped below any advantage to be gained by overtime operations. Had the business been so placed as to fill certain mills to maximum 24 hour capacity, most of those plants would have shown losses at the prices that prevailed. When competition has reached the point of direct injury to a large number of the participants, then it is time for the managements representing that industry to give more thought to their community of interest. This is especially desirable when the southern mills are exerting such a predominant influence as over 80 per cent of the spindle hours.

Table 3—Spinning Activity in the United States

Year	Active Spindles relative to Those in Place	Capacity Used relative to Active Spindles	Capacity Used relative to Spindles in Place
1922	97%	96%	93%
1923	97	102	99
1924	95	82	78
1925	92	101	93
1926	92	103	95
1927	94	112	105
1928	94	101	95
1929	93	113	105
1930	92	89	82
1931	89%	97%	86%
1932 Jan.	77	109	84
Feb.	78	118	92
Mar.	77	116	90
Apr.	73	96	71
May	68	93	63
June	65	89	58
July	62	83	52
Aug.	70	104	72
Sept.	76%	125%	95%

At this time, competition continues to take its toll from the industry. Some plants are being forced into idleness while others are being re-organized to come back and cut deeper in accordance with the revised valuation.

How long can this competition continue? This type of individual sacrifice can be continued for a long period since the tremendous investment in plant facilities has contributed a fixed item of depreciation that plays a prominent part in the costs. While the financial management is willing to continue to give away part of the plant facilities, then business will continue at unsatisfactory prices. Right now there is competition to give plants away to customers by not asking those customers to pay a price sufficient to continue the original plant investment.

When a mill can get back all of the immediate cash expenditures, that plant can be continued in operation without drawing upon the working capital. If raw material prices are declining, then it is possible that the mill may accumulate cash that can be used to cover losses or to meet extraordinary expenditures. When a mill can recover a part of depreciation charge in addition to the cash expenditures, then that mill may be improving its cash position. This last condition will permit prolonging the uneconomic condition so long as parts of the plant can be transferred into cash. When it becomes necessary to make machinery replacements, a sudden shortage of funds will make the financial plans tumble and the mill will be withdrawn from competition until such time as new conditions will attract the new money necessary to rehabilitate the plant and return it to manufacture.

Between plants, the differences in costs in combination with the depreciation item, present an interesting relation as indicated in Table 4. Here are compared the costs in several mills.

You can observe that Mill G may recover only cost, while Mill D makes a normal profit and Mill A is making a fine showing. Mill G may continue in business until the prices have declined to 90 per cent, at

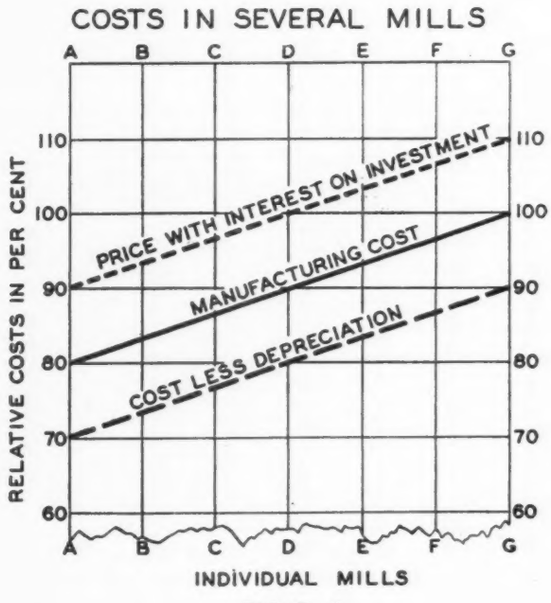


TABLE 4

which point Mill F is making two-thirds of its depreciation, Mill D is breaking even, and the mills, A, B and C are still enjoying profits. Thus the decline can go on, so long as the saleable capacity can be furnished by the mills that recover a part of the depreciation. If Mills A, B, C, and D can furnish all of the production to satisfy the customers' requirements, then the sales price may be expected to work down to the 80 per cent level.

Co-operation between the members of the industry can be of real help to prevent the ravages of a competition that devours itself. Too much attention has been given to fighting for the immediate advantage of volume that will permit of higher capacities as a means to cut costs. In the meantime, sufficient attention has not been given to the lowering of the real costs as a way to improve the competitive position, and thus to permit of continuance in operation so as to be able to take advantage of the profit making opportunity that will be offered with the turn back towards normal. Preparation provides the endurance that may prevent your plant from paying toll for the industry.

Helpful CHEMISTRY for Use in Wet Finishing

Article I

"GIVE us an article that will aid in supplying the finisher with the necessary fundamental chemistry concerning the materials used in his processes"—was the request made of Mr. Kelly.

In preparing this article he has covered the ground thoroughly, and in an understandable manner has provided a reference that clarifies the relation of chemistry to the problems of wet finishing . . . . . .

By Andrew J. Kelly
Burkart-Schier Chemical Co.

A FAIR degree of familiarity with the simple principles of chemistry is fast becoming a necessity in the practice of dyeing, bleaching and finishing. Such terms as hydrogen ion concentration, dispersion media, electrophoresis and others are becoming so common that a little knowledge of them is necessary to help lessen their heroic proportions—a sort of self-defense proposition, so to speak.

There are more immediately practical considerations, of course. Consider the action of alkalies on wool. Everyone knows that this fiber is exceedingly sensitive to caustic alkali. Recent research, being not entirely content with this general statement, has tended to show that wool may be safely processed when the pH of the processing bath is between 4 and 8. W. D. Appel of the U. S. Bureau of Standards reports that the iso-electric point of wool is pH 3.4 and he goes on to say that the iso-electric point is "the pH at which the fiber is least soluble and at which it undergoes minimum swelling." Positive and accurate data of value will soon forthcome, but the wet finisher must be equipped to take advantage of it.

A more simple instance of the value of applying simple chemistry to dyeing and finishing may be shown in the case of many mills whose water supply shows some degree of hardness. Soda ash or trisodium phosphate is commonly used to ameliorate the hard water condition. Practical procedure is to add the alkali first to the bath and see that it is thoroughly dissolved and dispersed before soap is added. However, it is quite a usual practice to add the soap and alkali simultaneously, or even the soap first. This means that some of the calcium and magnesium salts present will unquestionably react with the soap to form the familiar and troublesome insoluble soap scum.

Another instance may be cited in the use of sodium peroxide for bleaching. In the reaction of the peroxide powder with water, caustic soda is formed, and sulphuric acid is used to neutralize the alkali. In some cases, however, the alkali formed is of benefit and may be utilized by omitting the acid; this makes the process that much safer on vegetable fibers. The manufacturers of the bleaching materials should be consulted before bleaching formulas are radically changed, in all cases. This is a good safety procedure.

The foregoing examples are only a few instances wherein chemistry can prove of definite aid. For the practical dyer to obtain sufficient technical data to take advantage of these facts will require no very considerable effort. A seeming paradox in the consideration of the simple chemistry of wet finishing is the fact that many of the dyers who will stoutly aver "I'm not a chemist" are among those taking the most advantage of available data.

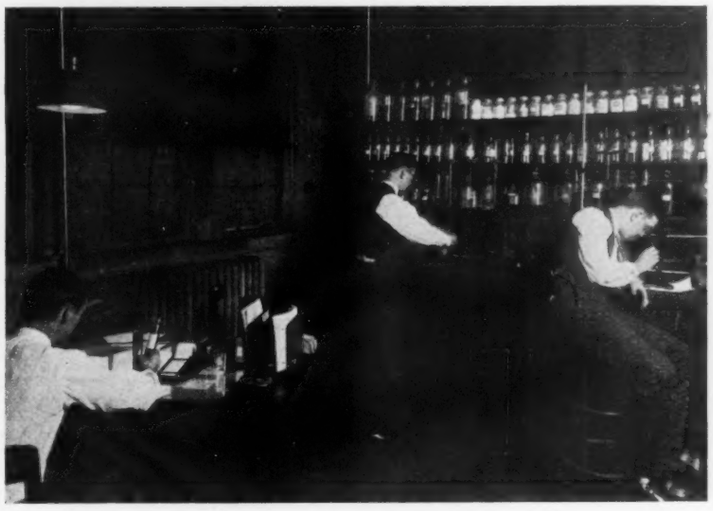
The industrial alkalies are probably the most heavily used textile chemicals and deserve particular attention. In applying the alkalies in wet processing, there are two factors of equal value to consider: the operation at hand and the action of the fiber to be treated. Aside from the mercerizing process, alkalies are used primarily for the scouring of textiles. The problem in boiling out cotton is the removal of vegetable waxes and resins (called pectins) and a strongly alkaline bath is very effective—hence caustic soda is both advisable and economical. The synthetic fibers are commonly scoured with soaps or soluble oils in combination with soda ash or trisodium phosphate (and sometimes both, as there is some doubt existent as to their relative merits.)

The rayons do not have any natural waxes or gums to be removed, but they do have what may sometimes present considerably more difficulties—mineral oil used to lubricate the yarn. In some cases as much as ten per cent of oil or more (based on the weight of the goods) may be present. This oil is neither soluble in hot water nor saponifiable. It is easily removed from the fiber and may be seen floating on the boil-off bath, but if not emulsified or dispersed it will just as easily re-deposit on the goods when the bath is dropped. On this account it is necessary that sufficient soap, oil, or other scouring agent be present to really emulsify the oil.

There is undoubtedly some more or less general misapprehension concerning the use of soda ash or other mild alkali in scouring rayon. Alkaline baths, alone, (even very alkaline ones with caustic soda) will not emulsify mineral oils; the alkalies will aid and expedite the action of soaps and other scouring agents but alone they cannot emulsify these inert oils. Yet, there are many cases where alkalies are expected to bear the bulk of the burden of boiling

off some synthetic fiber. Occasionally, rayons are oiled with the "self-emulsifying" oils which are of themselves emulsified in warm water—the foregoing remarks do not apply entirely to these oils. However, in all cases well-oiled rayon must be well-scoured before it can be dyed or finished in the proper manner and with best results.

The degumming of silk presents a different problem. Here we have a gum-like sheath, completely encircling the fiber, which must be removed. Alkali will dissolve the gum, or sericin, but it will also attack the fiber. Many dyers prefer to boil off silk with a neutral soap, depending upon the slow hydrolysis of the soap to keep the alkalinity low but fairly constant. Degumming oils containing alkaline sulphonated oil buffered with silicate of soda are extensively used. They are generally more economical, have less of a scum-forming tendency in hard water, and give a good boil off in a well controlled operation. Both soda ash and trisodium phosphate find use in conjunction with soaps and oils in degumming silk; they offer an economy of operation and are safe if carefully handled; however, it is to be assumed that care will be exercised in in processing the valuable silk fiber.



A present-day textile chemical laboratory . . . . .

In handling wool, caustic alkalies are avoided but a great quantity of soda ash is used. High temperature and excess alkalinities are to be avoided. Further work on the iso-electric point of wool, and its optimum pH, may bring about important changes in the methods of scouring the fiber.

Besides the alkalies mentioned, there are others which find use in wet finishing. Aqua ammonia, silicate of soda, sodium metasilicate, borax, and modified alkalies may be mentioned. Ammonia is notable as a volatile alkali: unlike the others it will not concentrate on fibers on heating. Silicate of soda is much used in connection with peroxide in bleaching. The metasilicate is comparatively new in the industry but is finding a niche. Other mild alkalies have various uses, generally indicated by their nature.

The textile industry consumes huge quantities of acids—most common are sulphuric, acetic, formic and muriatic (or hydrochloric), probably in the order named. All the textile fibers are sensitive to concentrated solutions of the mineral acids (i.e. sulphuric and muriatic) but the animal fibers are more resistant to dilute acid, as are the vegetable to alkali. Cotton is easily tendered by very dilute sulphuric acid; this acid has a high boiling point and will concentrate on the fibers when the material is dried so it should be very carefully and completely neutralized. Extreme care should at all times be exercised in using mineral acids on cotton, whether for bleaching, scouring, or what-not.

An operator of a large bleachery has remarked that for every pound of cotton injured by excess alkali there is a hundred pounds affected by acid. Some recently conducted experiments (unfortunately the name of the experimentor is not at hand) developed this data: "in a hot sour it appears that hydrochloric acid attacks cotton considerably more than does sulphuric acid of the same concentration, but when souring is effected warm then hydrochloric is less destructive than sulphuric acid. These facts allow the bleacher to make a useful choice between the two acids according to the temperature of the souring treatment which is necessary."

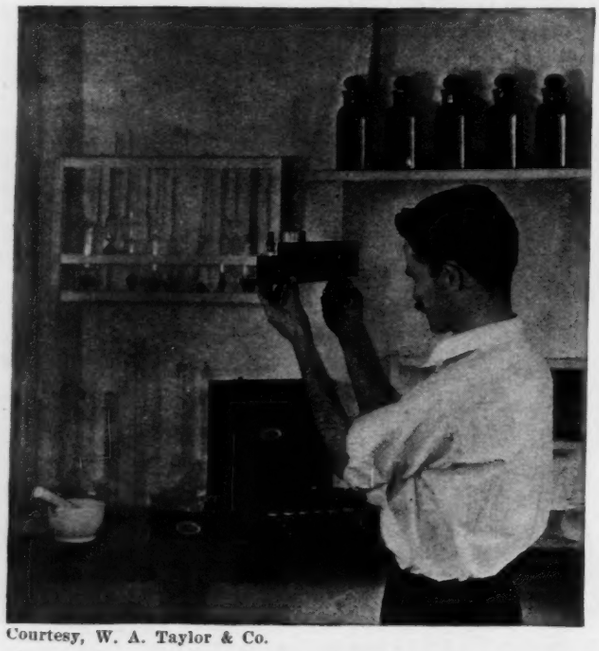
On the other hand, it is said of wool that plain water at higher temperatures is more harmful than dilute sulphuric acid. The theory of wool carbonizing is based on this difference between the wool and the vegetable fibers or cellulose material. The immunity of wool to harm from acid drying on the fiber is considered to result from a chemical combination between the acid and some basic constituents of the wool. The various synthetic yarns are similar to cotton, naturally, in their susceptibility to acid action. Silk is more immune to dilute acid but mineral acid should not be dried in the fiber; silk is especially liable to harm from the action of dried hydrochloric acid.

Formic and acetic acid are more volatile acids, of the organic series; they do not concentrate on the material on drying and are safe to use. Where cost does not prohibit, both cotton and rayon can be more safely treated with these milder more volatile acids; they have the same property of neutralizing bases or alkalies. The term "fatty acid" is sometimes misinterpreted—fatty acids are the constituents of saponifiable oils which combine with the sodium or potassium of alkalies to form soap. They are not water soluble and do not have any acidic action on textiles.

Acids, bases and salts—a familiar trio to even the most elementary chemistry course—all find regular use in the dyehouse. Common salt (sodium chloride), Glauber salt (sodium sulphate), sal ammoniac (ammonium chloride), bluestone (copper sulphate), aluminum acetate, sulphide of soda, hydro-

sulphates; these are some of the salts most generally used. The so-called "aniline salt" has been a familiar chemical for many years to those who dye aniline black. It is generally made on the spot by direct admixture of aniline oil (amino-benzene) and hydrochloric acid, forming the aniline salt, or aniline hydrochloride. Bluestone, sal ammoniac, sodium chlorate and other salts are used in the rather complicated process of obtaining a good aniline black. Aluminum acetate is required in most of the formulas for waterproofing, whether by the aluminum soap or the colloidal wax method. One of our largest of circuses is said to use a combination of ammonia and copper oxide for waterproofing its tents.

But the most common of all salts in the average wet finishing plant are no doubt sodium chloride and Glauber. One or the other is added to the dyebath to improve the leveling of shade, exhaust the bath, and set the colors. In general, increasing the percentage of salt will add to these properties —one theory of the use of salt in dyeing being that it makes the dye less soluble in the bath, and hence more inclined to affix to the fibers. Adding salt may be overdone, however — in the one-bath method of boiling out and dyeing a great excess of salt will show a tendency to "salt out" the soap or oil present, thereby decreasing the efficiency of the bath and possibly causing spotting.



Courtesy, W. A. Taylor & Co.

Slide Comparator for pH control . . . . .

The use of sodium hydrosulphite (a salt of hydrosulphurous acid) for stripping is familiar, other stripping agents include zinc or sodium sulphoxylate formaldehyde and certain titanium salts, usually titanium trichloride or titanium sulphate. The former is a violet colored crystal and the latter green; they are generally sold as solutions.

Soaps and soluble oils may be classed among the major chemical raw materials of the dyeing and bleaching industries. Soap is defined in the *Encyclopedia Britannica* as "a chemical compound, resulting from the interaction of fatty oils and fats with alkalies, i. e., the salts of the fatty acids." This definition would of course include also the insoluble or metallic soaps, and chemically this is correct; however, the term soap is currently applied to only the water soluble fatty acid salts, generally of soda or potash, but also of ammonia and triethanolamine.

Potash soaps are becoming less common in textile usage, and ammonia soaps have ever been rare. A first consideration in the use of soap for detergent purposes is the avoidance of the formation of the so-called soap scum; this is done by removing the calcium and magnesium salts dissolved in the water. Any good zeolite water softening process will perform this function adequately. Where there is no softener the use of some mild alkali such as soda ash or trisodium phosphate is beneficial. These chemicals precipitate the lime or magnesia as insoluble carbonates or phosphates. If soda ash or trisodium phosphate is used, it should by all means be added to the bath first and given time to react with the hardness minerals before any fatty constituents are added; this is good procedure even where soft water is available. Likewise, in making up a stock solution of soap it is not a bad idea to use a little mild alkali in the water. Many dyers use a little soda ash or "tsp" in rinse waters to assist in the complete removal of residual soap from the goods.

Sudzing is often considered the major factor in judging the efficacy of soaps used in scouring — this factor is largely applicable to ordinary soap solutions but some of the solvents and penetrants used in conjunction with soaps have a tendency to inhibit sudzing, even while increasing the efficiency of the bath. There is some controversy as to the effect of alkalies on sudzing; claims are made that they increase, other claims are made that they decrease, this phenomena. Both claimants seem justified as there is no doubt an optimum pH for sudzing, even as there is for most everything else. Rhodes and Bascom say that the maximum efficiency of a soap solution is attained when it has a pH of 10.7. Concerning the "collodial clays", now finding some use for scouring in combination with soap, there is as yet little available experimental data on this interesting subject.

The factor most often mentioned in considering soaps is the "titer"—this is the solidifying (not the melting) temperature of the fatty acids of the soap. It can be determined roughly as follows: a concentrated solution of the soap is made and acidified with dilute sulphuric acid. Heat with agitation until the fatty acids separate as the clear upper layer. Carefully pour into a test tube enough of the fatty layer to cover the bulb of a thermometer. Cool slowly, while stirring with the thermometer. At the point of solidification the temperature will remain stationary for a little while or perhaps rise slightly—this point is the titer. This is one of the constants of

(Continued on page 43.)

South Carolina's Campaign for Better Cotton Brings Definite Results

By A. B. Bryan

THIS brief article tells of the five-year campaign for better cotton in South Carolina; how the growers profited by raising those lengths of staple that the mills of the state use; how a large portion of the mills' requirements are grown "at home"; and other interesting information.

It is published to inform manufacturers elsewhere of the accomplishments in South Carolina, and to urge similar activity in other coton-growing states where mills are located . . . . . .

SOUTH CAROLINA'S five-acre cotton contest, "for better yield and staple value," has accomplished, in the six years it has been conducted, three noteworthy results: *first*, it has been financially profitable for some 5,000 contestants who have reaped higher cash returns; *second*, it has been a source of much valuable new information regarding purebred seed and better fertilizing and cultural methods; *third*, it has greatly raised the quality of cotton produced in the state and thus has given the cotton mills a home supply of cotton demanded for their purposes.

The purposes of the contest, which has been conducted by the Extension Service of Clemson Agricultural College, were "the production of staple lengths—15/16 to 1 1/16-inch—desired by South Carolina spinners, and to show that such lengths can be produced by the farmer when methods of production adapted to present conditions are followed."

Back of this purpose were the two deplorable facts, *first*, that the state average yield for the five-year period 1921-1925 was only 152 pounds of lint per acre, an unprofitable yield; *second*, that since most of the cotton mills of the state desired cotton with a staple length of around one inch and could not find it in South Carolina, they were filling their requirements with cotton from the western belt while much South Carolina cotton was being shipped from the state at great loss to farmers and mills.

Briefly, the cotton contest and its consequent benefits came out of the failure of South Carolina mills to use South Carolina cotton. A questionnaire sent in 1925 to the mills by the Agricultural Extension Service was answered 100 per cent by the mills furnishing data on their needs and samples of cotton desired and their inability to secure their needs in South Carolina, so eager were they to find a way out of having to transport their cotton from western areas. Director W. W. Long, on this basis, instituted in 1926 the cotton contest, "for better yield and staple value", and a progressive newspaper, *The State*, Columbia, S. C., lent zest to the movement by donating $2000 for prizes the first year.

When results and promises of the first year's contest were presented to the Cotton Manufacturers Association of South Carolina, that body was pleased to contribute the $2000 prize money for 1927, and again for 1928, and still again in 1929 for a three-year period, realizing that the contest was rendering the spinners as fine a service as it was rendering the growers. Furthermore, numbers of individual mills helped the cause by purchasing purebred cotton seed for distribution at cost among farmers and in a half dozen instances by donating funds for local prizes in the counties where the mills are located. Alston H. Garside, economist for the New York Cotton Exchange, lent a hand by giving wide distribution to data about the good work. Still another important factor in promoting the contest was the activity of the Pedigreed Seed Company, scientific seed breeders at Hartsville, particularly in selling purebred seed at a big discount to contestants each year and in giving $2000 for a supplementary contest in Darlington county in 1930. The good work of the mills in buying the better quality cotton at a premium is spoken of elsewhere in this article.

For Better Staple Value.

Ninety-five per cent of the 5,000 cotton contestants over the six-year period have planted pedigreed or highly improved seed and the production of the undesirable ⅞-inch staple among these contestants has dwindled from 54.6 per cent to the lint grown on contest plots in 1926 to 5.1 per cent in 1931, while the production of 15/16 to 1 1/16-inch lint from contest plots rose from 40.8 per cent in 1926 to 94.8 per cent in 1931. Which is another way of saying that, other things being equal, these contestants averaged greater profit per pound or per bale as the contest progressed.

But that is by no means the biggest gain in this matter of better staple. Each contestant has become a source of good planting seed, supplying his neighbors and others with source of better quality cotton. Furthermore, the good news of contest results, spread through many channels, caused thousands of other farmers to buy purebred seed directly or indirectly from scientific seed breeders. The effect on the quality and staple length of cotton produced in the state as a whole has been remarkable.

In 1926, when the effort toward improvement began, only about 15 per cent of the South Carolina crop was 15/16-inch or longer, while in 1931 the percentage was 60.6, with a corresponding decrease in the percentage of ⅞-inch cotton. In fact, reports of the Bureau of Agricultural Economics show that South Carolina is now producing a higher percentage of her crop in staple of 15/16-inch or longer than any other southeastern state. Figures for 1929, 1930,

1931 show this state's percentage of such lengths to be 36.7, 53.3, and 60.6 respectively; North Carolina's being 24.4, 40.7, and 57.8; Georgia's being 10.8, 15.8, and 22.9; and Alabama's being 2.8, 5.4, and 15.5. These figures show excellent progress, however, for all four states.

Goal Not Yet Reached.

About 80 per cent of the million or more bales used annually by South Carolina mills is 15/16-inch or longer staple. South Carolina farmers grew in 1931 slightly over a million bales of which 60.6 per cent was of the lengths wanted by the mills. Simple mathematics will show that there still remains among South Carolina mills a market for some 200,000 more bales of the better lengths. On this matter of further improving quality of cotton R. W. Hamilton, extension agronomist in charge of the contest, says:

"With increasing foreign competition in growing the shorter staples and with prospects for continued low prices, it is imperative that farmers continue to inprove the quality of cotton by using improved seed. South Carolina is fortunate in having within the state scientific seed breeders who are constantly developing and breeding up those varieties or strains of cotton with staple length and character that meet the requirements of South Carolina mills, for such breeding work can not be done by the general cotton grower." This is true, also, of other states.

Better Staple Brings Higher Value.

Four years' results in the cotton contest, 1928-1931, show that the better staples up to 1 1/16-inch give a larger yield per acre than the 7/8-inch varieties, disproving a common belief; and figures on value per acre show a larger profit per acre for these better staples, actual yield per acre and price per pound obtained being considered. Records of over 2,000 farmers show that cotton stapling 1 1/32 inches in length averaged the highest yield per acre, and the highest money value per acre. The average increase in value per acre over the value of 7/8-inch cotton for the four years was $4.18 for 7/8-inch, $8.70 for 15/16-inch, $14.44 for 1 1/32-inch, $11.07 for 1 1/16-inch, and $11.76 for 1 1/8-inch. Mr. Hamilton reminds us that there has been a marked improvement in facilities whereby farmers receive premium value for their cotton, an improvement which will continue as farmers learn to grow better cotton, know its real value, and demand the market price on the basis of quality.

First of the factors through which farmers are coming to receive the market price on the basis of quality is the farmer himself—his better knowledge of staple length, grade, and quality, as well as his better appreciation of supply and demand, and his better information on the use of varieties and cultural practices, ginning, storing, etc., and their effect on prices. The farmer, in short, is better educated as to these matters through the agricultural experiment stations, the extension service organizations, the cotton cooperative associations, and other agencies.

A second factor is the cotton mills which by putting their buyers on the markets instructed to give the differential in price for quality and length of staple, are helping to break up the former practice of independent local buyers disregarding quality and staple. Cotton is not longer "just cotton" where these buyers operate. In many instances mills contract or agree to give the premium for quality if farmers will grow one variety or quality of cotton in the community or county. An instance is that of farmers at Easley, S. C., who organized for group production in 1928, grew an improved strain of Cleveland cotton, and received from a Greenville mill 200 points above local market prices, so that since then farmers and spinners have manifested increasing interest and premiums have been 200 to 300 points for quality.

That the spinners are finding the results of the cotton contest profitable may be judged from the testimony of a leading cotton mill man, who in a recent letter to Mr. Hamilton says:

"Some two or three years ago and prior to that time we used mostly western cotton. But the last two years at these mills we have used, I should say, 95 per cent local and nearby cotton. The results have been most encouraging. Considering the cost to the mills, the better price to the farmers, and the running qualities of the local cotton, I feel that your work and the participation by the Cotton Manufacturers' Association has been a handsome investment. Under no circumstances should I like to see South Carolina cotton deteriorate in the future as it did for some years prior to your efforts, and I hope some way will be found and followed to prevent such a condition."

Other factors that must be considered are the influence of the cotton co-operative association and the state warehouse commission. The co-operatives have not only secured the differentials for their members but have graded and stapled much cotton for non-members at a small fee and have had a generally stimulating effect in securing the differentials. The state warehouse commission has, through co-operation of the Bureau of Agricultural Economics, U. S. Department of Agriculture, been active in grading and stapling cotton for farmers to furnish official basis for proper price differentials."

Yields, Costs, and Profits.

Summary figures for four years, 1928-1931, on average yields, costs of production, and profits in the cotton contest make interesting reading and carry valuable suggestions.

In 1928 the contestants averaged 556 pounds of lint per acre at a cost of 5.5 cents per pound or $52.74 per acre, leaving an average profit of $86.51 per acre on the basis of prices for December 1.

In 1929 the averages were 480 pounds of lint per acre costing 7.1 cents per pound or $49.39 per acre, leaving $51.39 profit per acre. In 1930 the averages were 508 pounds of lint per acre costing 6.3 cents per

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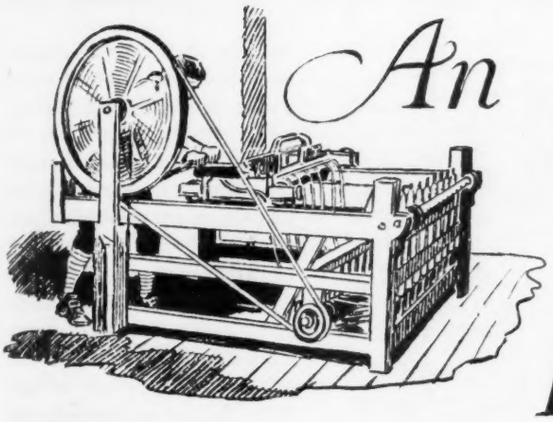


An Outline of Textile Invention

FOR MANY YEARS YARN FOR WEAVING CLOTH HAD BEEN SPUN, ONE THREAD AT A TIME, ON THE SPINNING WHEEL. IN 1764 JAMES HARGREAVES, AN ENGLISH WEAVER, INVENTED A SPINNING MACHINE, CALLED THE "JENNY" THAT COULD SPIN EIGHT THREADS AT ONCE, THUS ENABLING ONE MAN TO DO WHAT FORMERLY HAD BEEN THE WORK OF EIGHT.

◆ ◆

"Editor COTTON:

"The information in this article was 'dug up' while carrying out some research and investigation on another matter.

"While it is in no way complete in detail nor comprehensive in covering the subject, it occurred to me that put together in this form it would interest many of your readers as it interested me at the time of my investigations.

"It will tell them something of the origin of many of the processes with which they work from day to day in the manufacture of yarn and cloth, and, I hope, will picture for them the progress that has been made along several lines.

"Care was exercised in the compilation of the information, dates, names, etc., and I believe the material is essentially correct as I have depended upon reliable references and sources.

R. B. Smith."

◆ ◆

By R.B. Smith

THE ENGLISH ENGINEER, Joseph Nasmith, calls attention to the peculiar development the textile industry has experienced as compared to the usual growth and improvement of other major industries. The development of the steel industry, the science of mining, and even agriculture has been gradual and steady since the dawn of history. There have been few radical changes in practice or mechanical aids in these industries.

In the textile industry the difference of its history is remarkable. The art of spinning with the distaff and spindle remained the same for thousands of years and was rendered entirely obsolete and revolutionized by a few inventions brought out during the last century.

The greatest single invention in the textile industry is the simple expedient of putting twist in a sliver or a series of parallelled fibers to make them grip one another and produce a continuous strand of thread. This invention was probably made with an animal fiber by one of our ancestors only a few thousand years advanced from the tail hanging stage. This genius of his day probably was handling between his thumb and forefinger a batch of bear hair. As he twirled and twisted this hair as we moderns do our thumbs when idling time, he glanced down and discovered that the strand had grown in length. And lo, this length was greater than the length of any individual hair! Thus was born the basis of the third greatest industry of the world employing countless billions of dollars in capital.

Putting in the Twist.

Twisting by hand and adding small amounts of fiber to the twisted strand was slow work. The resulting thread was thick and uneven. The effort required for a few yards of yarn was prodigious. The second invention of importance was the distaff and spindle. The distaff, although not an essential part of the apparatus, was helpful, and consisted of a rod of wood with a tapered blade to hold the material to be spun by the hand rotated spindle. The spindle itself was a round-pointed piece of wood with a notch in its top to hold the unspun sliver and impart twist into it.

We next reach a really great invention in our journey to our present day art of manufacture. This invention, by the way, without question was originated by our predecessors in "cotton milling" and this same invention was appropriated for other use and is one of the primary mechanical movements of all our marvelous machinery. It was the use of one large wheel, one small wheel, and a belt around the outer rims of both. One rotation of the large wheel produced many rotations of the small wheel. It is difficult for the writer to stress the importance of this idea on our march of progress. Remember we are not comparing it to some marvels of today, but bringing it to your attention as one of the great inventions of the world as regards its helpfulness. This

The illustrations in this article appeared in "High Lights of History", by J. Carroll Mansfield. They are reproduced through the courtesy of Francis W. Clarke, of the Atlanta Constitution, in which they appeared, and the McClure Newspaper Syndicate, which distributes this feature.—The Editor.

increase of speed was applied to the rotation of the spinning spindle, and we first acquire the boast of one mill man to the other that he had increased his production so much per spindle. He had increased his production per spindle a thousandfold.

The previous development was probably in Asia Minor. The use of the wheel being a European invention. The spinning wheel did not begin to have general usage until about 1800, although much of the yarn spun was so handled many years before this. You will recognize in this what seems to be the ingrained curse of the textile industry—this indifference and even antagonism to new ideas. The old distaff and spindle workers simply did not ilke to have all that complication of wheels and a belt.

OTHER INVENTORS, CHIEF AMONG THEM RICHARD ARKWRIGHT, IMPROVED UPON THE "JENNY" UNTIL IN 1769 A MACHINE WAS PRODUCED THAT COULD SPIN THIRTY THREADS AT ONE TIME AND AT A GREATER RATE OF SPEED. ARKWRIGHT LATER INVENTED THE CARDING MACHINE, A DRAWING FRAME, AND AN IMPROVED SPINNER, AND IN 1771 ESTABLISHED THE WORLD'S FIRST COTTON MILL AT NOTTINGHAM, ENGLAND.

The large wheel was refined by the Saxons and a treadle attached to permit foot operation. The writer calls attention again to an invention which is of importance in all mechanical movements: that of changing reciprocating motion to circular motion. In this case the writer believes the movement was worked out by experimenters from other industries and was appropriated by the textile machine builder.

Original Methods of Cleaning Cotton.

So far our industry has been concerned with the spinning or twisting of a series of fibers to form a thread for use in weaving by hand. The preparation of the fibers as for cleanliness and spinning quality has been little considered. In India there came into use a process known as "bowing" cotton. A supply of cotton was spread out and the bow brought into play to clean it. This bow as its name implies, was a crescent shaped wooden piece, with two threads stretched across. One thread was started vibrating and the other would vibrate in synchronism. The latter cord being in contact with a portion of the cotton, throws it about and separates some of the dirt.

Another method of cleaning was to lay a stock of cotton on a flat stone, and workers would roll with their feet small rollers about this batch and separate some of the dirt. Another was known as a "Churka" machine which was two rollers turning together and the space between which was insufficient to allow the seed to pass. This separated some seed and dirt.

The art of cleaning and carding fiber originated in England and the dawn of the sixteenth century saw steady improvement in preparatory machinery. Hand carding was being used extensively now and we are at the point where inventors are thinking about machines which are more nearly automatic in cleaning and straightening the fiber. The system of drawing by rollers was originated by John Wyatt of Birmingham, England, about 1740. The name Arkwright is also mentioned in this connection. We shall hear more of him later in some phenomenal work. Lewis Paul of the same city invented the revolving cylinder card in 1748. You will here note that the key to our modern system of spinning is reached. That is, the requisite number of yarn being decided by the relation between a series of revolving rollers.

The invention of drawing rollers then marks another milestone of progress. There seems to be good reason to believe that Lewis Paul and John Wyatt worked them out, Wyatt being the real inventor. The use of these rollers and their service to the spinning frame will be referred to later.

The First Card.

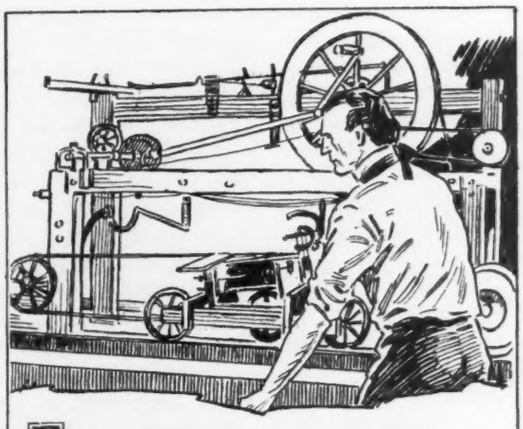
Hargreaves made the first card, it having two cylinders with different surface speeds. We have developments fast along here and we are in the midst of the machine age of textile manufacture. John Lees of Manchester attached an apron feed to the card and made a fine contribution. This was in 1772. It is well to remember this date, for it marks the time when we have for textile use the first complete machine for continuous production. Arkwright added the stripper or continuous method of removing the cotton from the card, it now being fed continuously by the moving apron. The year 1774 produced the first card having these improvements, and in the few months following, the doffer comb was worked out.

We now have our card substantially as it is today. An apron was used in some cases to feed the stock, but Arkwright also devised the lap with means for feeding it to the cylinder at a continuous rate. The doffer cylinder was then added, now the doffer comb was attached to take the carded fleece from the cylinder and form the first web. David Cheetham, in the employ of Mr. Tatham, made the first coiler to receive the twisted web of sliver of the card.

The Fly Shuttle.

We have passed by a year which showed developments in the weaving. In 1738 the fly shuttle was invented by John Kay. This device not only enormously increased the production of the hand looms, but really was the incentive for the developments in spinning and carding which followed it. In other

words, there was a greater demand for yarn from the weavers than the spinners could supply. To John Kay, then, should be given credit for supplying the incentive to invent to all the gentlemen mentioned as contributing to spinning and carding.



SAMUEL CROMPTON IN 1779 INVENTED THE "SPINNING MULE" THAT SPUN A VERY FINE THREAD FOR THE MAKING OF MUSLIN CLOTH. BEFORE THESE MACHINES WERE INVENTED, IT TOOK MANY SPINNERS TO KEEP A FEW WEAVERS SUPPLIED WITH YARN. NOW THE WEAVERS COULD NOT KEEP UP WITH THE PRODUCTION OF YARN.

The First Spinning Frame.

While the card was being perfected, Arkwright made the first spinning frame. A frame meaning a series of spindles in line with a series of large wheels driving small wheels with a band. You understand that previously each spindle was a unit spinning frame, just as today each card is a unit. This was about 1770. Arkwright added to his frame flyers or throstles. This was the forerunner of the modern fly frame and worked on the basic principle of flyers. James Hargreaves refined the work of Arkwright and produced the first frame with not only a series of spindles, but with one hand wheel to drive the entire frame. Please note at this point that the necessity for power, such as the steam engine, became very apparent. People living at this time lived to see such a prime mover produced for this purpose and we find ample proof that "necessity is the mother of invention."

It is well to note that we really have two types of spinning. Arkwright used the rollers to draft and deliver roving in predetermined lengths which was then spun and twisted into yarn; then the flyers were brought into play to twist it. Hargreaves made the series of spindles into a unit with one source of power. Watch this germ grow into first spinning frame which gave good results—the "mule" it was called because it had a hybrid parenthood. Samuel Crompton made the first mule spinning frame in 1779. His frame had all the elements of the mule today; that is, the delivery by rollers, the spindles in row in a carriage, and the alternate delivery of yarn and the spinning of the delivered portion.

The "Spinning Jenny".

In the year 1790 the workers in cotton mills were startled by the announcement that water power had been coupled to the spinning jenny. We find it hard to think why this should have excited anybody. Well, if we should read today in the papers that a machine was now perfected and in use which permitted a bale of cotton to be thrown into it and spun yarn of fine texture to come out the other end, do you think that the spinners of this country would simply yawn and toss the paper on the floor? Hardly! Think of the huge number of men employed whose sole job was turning the crank at the end of a spinning frame. No loose pulley in those days. In a few years we are to learn of still further use of power and the steam engine perfected. Cotton mills away from water were helped.

Living on until 1818, our spinning jennys are water-driven and their production enormously increased. Still, there were three operations purely manual and requiring skill. These were the action of the faller in guiding the yarn, the reversal of the direction in the rotation of the spindles to "back off" the yarn wound to impart twist into it, and the regulation of the speed of the spindle to take up the yarn delivered to it at a constant rate. William Eaton, really a mechanical genius, combined these three operations into one with his self-acting copping motion. Eaton, however, produced a frame which developed frequent mechanical trouble and a delegation of spinners visited Richard Roberts, a mechanic of widely known ability, and asked him to work on the problem. (The writer calls attention here to the frequent occurrence during these years of the "hired inventor." We read often today of the fact that he is the main originator of new things.) Roberts worked five years on the problem and manufacture was started of an almost perfect mule spinning frame. He made numerous mechanical refinements and his mule was substantially the machine of today.

Across the ocean in America cotton was being grown for the world. The southern planters found trouble in getting enough cotton ginned for the market. There was plenty of demand for cotton, but ginning was the problem. Eli Whitney, a New England school teacher, who had moved to Georgia, invented the saw gin in 1793.

More Attention to Cleaning.

At this time more and more attention was being given to cleaning cotton. The foundation of all cleaning was still the old "willow." The first scutching machine as the English call it, or the picker as we know it, was invented by Snodgrass, a Scotchman.

The Fly Frame.

The development of the fly frame is now in progress. It, of course, is virtually a spinning frame, and its component parts are the same as was in use on the previous frames of Hargreaves and Arkwright. The difficulty they were having was to regulate the speed of the bobbin so as to take up the twisted yarn at exactly the same speed, regardless of the diameter of the bobbin. That is, the differential motion as we well know it today. Many inventors worked on this problem. In 1823 Green pro-

duced one solution by means of rollers, but his device was too complicated. In 1826, Henry Houldsworth patented the first differential motion. His contribution of this mechanical gear assembly was great, not only to the cotton mill industry, but to many others using this movement. The automobile industry is indebted to the cotton mill industry for having furnished the incentive to invent the differential. The modern automobile could hardly function without this mechanical movement.

Ring Spinning.

The year 1828 brought out the ring spinning—in the writer's opinion, one of the world's great inventions. This was simple and economical to operate to such an extent that it soon made inroads into the use of the mule frame. Today it has just about replaced the mule in the spinning of cotton. John Thorpe was the brilliant inventor.

Man always strives to make his machines independent of him. The stop motion to stop a machine from running when anything goes wrong is a necessity toward this end. The first was invented for warpers by Bachellor. This was 1832.

William Mason built the first ring spinning frame during 1833.

Loom Inventors.

The marvelous shuttle changing loom was brought out in 1834 by Reid and Johnson. J. H. Northrop invented the automatic loom in 1894.

For about 80 years there was little contribution to textiles of major importance. Of course refinements and stamina were built into machinery more and more, but little else was done.

20th Century Developments.

As the twentieth century wore on, the automatic knotter was developed, and then in a few years the automatic spooler. These inventions, the work of Colman, rank with the important inventions of the industry. The automatic spooler was first put on the market about 1920, but it had been under experimentation for several years. The use of a magazine supply for warpers, doublers and later twisters also was worked out at this time. A good many individuals claimed credit for this development. By a magazine supply is meant stationary packages with a tip-to-toe transfer, the supply delivering over end.

Humidification must not be overlooked; it permitted cotton to be handled without regard to climate. The humidifiers as we know them today were invented by Kind, of Germany, in 1881. That is the spray type most in use. The atomizer head using compressed air is the work of Garland, of Biddeford, Maine, in 1879.

What of the Future?

We have surveyed the field and have come to the present day. Does it not seem to you that little has been done in the past ten years? Ten years is a short while in the period of the centuries, but a long time in the swift pace of today. Consider the automobile. What tremendous strides have been made in ten years!

Most improvements are worked out by young men; men in the middle of life. Older heads are needed as balance wheels and to prevent foolish ventures. Can it be that the only old heads are building textile machinery?

It is beginning to look as though new blood was needed in the manufacture of textile machinery. Henry Ford is quoted as saying that he would not be interested in textiles until machinery could be bought which would permit a bale of cotton to be thrown in and at least yarn come out, even the finished cloth. Such will certainly come to pass. It may be one hundred years, but it surely will come.

Bliss Fabyan & Company Find Payrolls Increasing.

Bliss Fabyan & Company, cotton textile distributors, recently completed a study of increase of the number of operatives in the 22 mills associated with them. They announced on November 10 that since July 30, the operatives had been increased 153 per cent, and that the payrolls in the same period had increased 150 per cent, and that as a result of orders now on the books for future delivery, it was expected that the 22 mills associated with them would continue operations at this rate for sometime to come. Bliss Fabyan & Co. point out:

"Had there been a commensurate increase in the rate of employment and payrolls in other major industries, even the most pessimistic industrialist, agriculturalist, distributor or investor would recognize that his psychology of gloom and apprehension must be changed, and that chaos is not around the corner, but that around the corner exists a terrific vacuum for the products of civilization which living generations recognize and require as did previous generations require crude shelter, food and raiment. The force of modern civilization continuously creates this vacuum and it is difficult to believe that any force of retrogression is powerful enough to change nature's abhorrence of a vacuum."

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Use of Cotton Fabric Belts Increasing.

A steadily increasing use of cotton fabric belting by cotton mills is indicated by reports of George A. Sloan, president of the Cotton-Textile Institute, showing satisfactory service in tests of experimental installations as well as in repeat orders by many mills for extensive new supplies. The use of this type of belting has been advocated for some time past by the New Uses Section of the Institute not only because of its demonstrated efficiency but also for the reason that its more general adoption by cotton mills would be another notable step within the industry to increase the consumption of cotton.

The Institute is informed that last year various mills made purchases ranging from 150 foot experimental lengths up to 15,000 foot installations for regular service. The majority of these mills now state that they will increase their purchases of cotton fabric belting and in some cases estimate that their requirements will run as high as 30,000 feet per year. The belting now in service is used most largely on spinning frames, but is also employed on carding and weaving machinery drives, for spooling, warping and speeders, and in general wherever belting is not run in oil.

There was a general consensus of opinion among the mills participating in the survey that cotton fabric belting is both satisfactory and economical.

Chemistry in Wet Finishing

(Continued from page 36.)

fatty acids and is a valuable determination in soap analysis, but since soaps usually contain mixed fatty acids it will not always serve to identify the soap stock. Generally speaking, the low titer soaps are more soluble and freer rinsing—typical of such soaps are olive and oleic. Tallow soap is typical of the high titer types. The low melting fats are ordinarily high in oleic acid; the solid fats contain more stearic acid. Since the high titer soaps are often cheaper it is advisable to check the possibility of their use. When high temperatures are customary for scouring and complete rinsing is assured, they should prove satisfactory. Care in rinsing is considered a fundamental necessity, whatever soap is used.

Referring to the insoluble soaps, these "black sheep" do find an application in wet finishing. One process for waterproofing calls for the precipitation of insoluble aluminum soap directly on the fibers by the interaction of aluminum acetate and a soluble soap solution. This method is meeting with competition from the colloidal wax waterproofers.

Sulphonated and special soluble oils find an almost universal application in wet finishing. Besides the well-known sulphonated oils such as castor and olive there have appeared new sulphonation products such as abietene-sulphonic acids, napthalene sulphonic acid derivatives, and others. The former is the sulphonation product of abietic acid which is the major constituent of colophony or pine resin. The latter is essentially a coal tar derivative. Some napthenic acid, present in Russian mineral oils, is also being compounded.

Degumming oils often contain alkaline sulphonated oils buffered with silicate of soda; some of them contain cresols and no silicate, others are liquid soaps containing some stabilizing agent—all of them usually have some free alkali.

Wetting and penetrating agents of the soluble pine oil type are very familiar; as a rule they are pine oil solutized with sulphonated castor or pine oil. Occasionally rosin-pine penetrants are encountered. A good mix of soluble pine oil can be made of one part of 50 per cent sulphonated castor oil to one part of pine oil. Efficient pine scours are made of sodium oleate and pine oil.

Another solvent finding use in wetting and scouring agents is ethylene dichloride; however, it seems quite possible that propylene dichloride, with similar odor (as of chloroform) and properties but with an appreciably higher boiling point may supplant it. Propylene dichloride has just recently been made available at competitive prices.

Sulphonated oils do not show the same tendency as soaps toward forming insoluble soap scums and so are often used under hard water conditions. Some mild alkali is recommended for use in conjunction with the oil. From one to three per cent of soda ash or "tsp" is of aid in boiling off silk or rayon or three fiber combinations. The sulphonated oils work well with these alkalies whose function is to increase the efficiency and lower the cost of the scouring operation. Both silk and rayons are quite resistant to harmful action from boiling in these mildly alkaline liquors.

(In the second section of this article, to appear in an early number, Mr. Kelly gives some simple, practical tests and methods of analysis of soaps, oils, specialty compounds and other chemicals, as well as suggestions on the storage and handling of heavy chemicals.)

South Carolina Grows Better Cotton

(Continued from page 38.)

pound or $41.27 per acre, leaving $22.16 profit per acre.

In 1931 the averages were 581 pounds of lint per acre costing 4.64 cents per pound or $33.29 per acre, leaving $10.70 profit per acre.

Regarding these significant figures, with striking decreases in net profits during the four years, Mr. Hamilton says:

"As prices for seed and lint have fallen, farmers have reduced cost of production per acre but they have not been able to make a sufficient reduction in cost to offset the lower prices. Cost per acre in 1931 was $19.45 less than in 1928 but profit per acre in 1931 was $75.72 less than in 1928, despite the fact that yield of lint per acre in 1931 was 25 pounds higher than 1928. It is interesting to note that yield per acre has not been reduced by reducing cost per acre. The use of fertilizer per acre has been lowered but better cultural practices and weather conditions have maintained yields.

"The reduction from 1928 to 1931 of $75.72 per acre in profit on these plots is very expressive of what has happened to cotton growing in general during the past four years. With a yield of 581 pounds of lint per acre at a cost of 4.64 cents per pound, giving a profit of only $10.70, it can easily be understood why farmers making only 250 pounds of lint or less per acre are facing bankruptcy."

More Plants Per Acre.

The wisdom of more plants per acre to secure profitable yields was brought out again in the 1931 results. In general the contestants had more plants per acre in 1931 than ever before and this fact doubtless was a large factor in the high average yield obtained by contestants.

Fertilizing Facts Found.

When the contest began in 1926 many farmers had a wrong impression that heavy fertilization was the biggest factor in large yields. Mr. Hamilton states that actual results over six years have shown that fertilizer is not the major factor in yield but that climatic conditions, soil conditions, number of plants per acre, and insect infestation are factors of greater importance than amount of fertilizer. Contestants have realized this and the amount and kind of fertilizer used on contest plots averages about what would be profitable for general cotton production, this being, in pounds of plant food per acre, 20 to 48 pounds of phosphoric acid, 18 to 48 pounds of ammonia, and 12 to 24 pounds of potash.

CURRENT TOPICS

Talk of the Month.

The General Situation in Textile Markets.

POLITICAL affairs can unsettle temporarily, also frequently, the trading in primary markets for textiles or other commodities but they do not affect the fundamentals of supply and demand except as they destroy consumer confidence. The extraordinary movement of all textiles for the three months prior to the Presidential election was built upon the previous wearing out of supplies and the absolute need of consumers. This gradual destruction of goods had extended over a period of three years and at last, after weary waiting, producers began to find an outlet for new goods in volume to promote manufacturing on the best scale since the start of the depression; even 100 per cent of capacity in rayon.

Thus, while the election of November 8 was a bugbear to the sellers of raw materials and the manufacturing interests of all kinds, there remained the underlying fact of a healthy demand and prospects of a continued activity for textile mills as well as other producers. The surprising thing in cotton textiles right after the election was that inquiries indicated a greater volume of requirements than buyers themselves had believed in sight after the relatively heavy movement from July to November. The secret of such a circumstance lay in the fact that the movement of goods into consumer channels was so close upon manufacture that inventories, reduced as they had been to the vanishing point, were given little chance to accumulate.

Among unsatisfactory developments of the period through the election, meantime, was the willingness of some factors to accept concessions when it was known that consumption was running along favorably and the sound presumption was that the lapse of buying from the mills would not last long, let alone the circumstance that weakening prices would not contribute to expansion of the whole volume of business. The shading of prices was not only unwholesome from the standpoint of the sellers, but unfair to the buyers in general. Sellers who had made a big turnover to certain buyers at one basis naturally were undermining the position of these customers when they accepted less from others. The case is the more censurable when such business is done without profit.

Confidence in the cotton-textile trade as well as in other business at mid-November was that less than the usual recessions would eventuate this winter and that revival would spread next year. The relationship of shipments of cotton goods to production was found to be favorable right up to November and talk of overproduction a thing to do with danger ahead rather than a general condition. At the same time, the regulation of production is never a thing to be overlooked, as experience has shown, and the fact that the Textile Converters' Association took a hand in the plans for the meeting at Spartanburg on November 15 (see below) was significant of the buyers' interest in creating stable mill conditions. As stated by H. Lauten, chairman of the converters' committee, preliminary to the meeting, the only apparent hope of salvation is "curtailment, through curtailment compatible with distribution and consumption."

Rehabilitation of industry is becoming a large issue, which is recognized by wide-awake managements in cotton textiles and the laggards will suffer from new competition. It has been estimated that the modernization and replacement of old and worn-out equipment and buildings, merely as a result of economy in this direction during the past three years, would mean an expenditure of about $30,000,000,000. In the cotton branch, the elimination of several millions of spindles has been recorded, but that is only the negative side of the picture. The modernizing of plants embraces economy of operation, improved competitive position and contribution to the expansion of general employment.

Following closely upon the introduction to this country of the English anti-creasing process of Tootal, Broadhurst, Lee, Ltd., has come announcement of a development by the Bellman-Brook Bleachery, of Fairview, N. J., which gives what is declared to be a much similar result. This process allows cotton fabrics to be turned into a finished cloth hardly distinguishable from wool goods in appearance, feel or wear. It is the outgrowth of cooperative efforts between the American company and one of the oldest finishing plants in Switzerland and is closely affiliated with the du Pont interests.

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New England Mill Situation.

SOMETHING rather ironic in the industrial situation of 1932 is that the nation's textile industry, buffeted and criticized for many years, is leading the country out of the depression. In this conservative section of New England, moreover, which once was the industrial center of the United States and is now only a constituent part of wide-flung manufacture, the textile branch is outstanding in an upswing which is conspicuous in the country at large. New England has long since lost its supremacy in cotton manufacture, yet it remains an important factor. And New England textiles are leading in this section.

Conservatism, often the reproach of this district, seems to stand well the test of time. It is a principle upon which cotton manufacturers of the district are standing today as a protection against over-reaching at the start of a movement toward resumption of normal. The word may be interpreted more as sound caution than over-caution. True New England did

have a spell of unhealthy or rash conservatism, when in the early post-war boom it took all the profits from obsolete machinery, instead of rehabilitating itself from returns which could not be expected again in normal times from such equipment. But today it is an awakened textile industry, to pursue a safe and sound policy, to get away from the disastrous era which, as often stated, extends further back than the general depression of the past three years.

Cotton manufacturers here naturally felt the deterrent effects of the election upon turnover and the drop of cotton incident to the Government report of November 9 and conditions up to the middle of November were such as to justify the warnings of mill leaders against rash expansion of production. In this section, moreover, many mills are given to production of novelty goods in which accumulations are particularly dangerous. Thus the policy has been to hold close to demand. At the same time it was one of the leaders in advocating careful production through the fall, Earnest N. Hood, president of the National Association of Cotton Manufacturers, who said right after the Presidential election:

"With the attainment of the political desires of so large a proportion of the people a feeling of satisfaction and confidence must prevail and this feeling should remove all necessity for any period of hesitation." He did, however, say that "although the issues of the campaign did not emphasize the matter of tariff rates this issue is of great moment to all textile interests. With depreciated currency in important competing countries the present tariff rates are inadequate and should be adjusted upward." Meantime, he voiced confidence in the end of unsettlement with the concluding slogan: "The election is over; let's go."

Among important mill changes of the section this year is the recent acceptance by the Dwight Manufacturing Company of an offer of the Nashua Manufacturing Company for its plant, at Somersworth, N. H., inventory and sheeting business and trade marks. By the terms, the purchaser was to pay the Dwight company $250,000; also 2¾ per cent of the amount of orders transferred.

Domestic Allotment Plan.

THERE is now being discussed by national legislators and men of national prominence, a revival of the Norbeck Bill which was defeated on the closing day of the last Congress. It is now known as the Domestic Allotment Plan and is nothing more than a bill trying to control agricultural surpluses. Interest in this plan was stimulated by Mr. Roosevelt's Topeka speech in which he advocated some of its principles as a basis of farm relief.

The purpose of the plan is to give the farmer the benefit of a tariff on agricultural products that are exported, and which would include wheat, cotton, rice and hogs, and to adjust acreage in line with market requirements.

This plan, as embodied in bills now in Congress (H.R.12918 and S.4985) calls for an excise tax upon flour, or its equivalent, of about two dollars per barrel, and on cotton, a tax of 5 cents per pound to be paid by the mill consuming the domestic upland raw cotton. The funds collected under this plan would be distributed among the producers of wheat and cotton according to allotments based on previous production. In return, the producer would contract to control or to reduce his acreage, as decided by the administrative agency.

We normally consume about 5,750,000 bales of upland domestic cotton. This would mean taxing the mills or some one else about $145,000,000.00.

In addition, it would have a marked effect upon tariffs, foreign competition, influence of disparity between price of this commodity and other commodities.

Legislative experience indicates the impossibility of the success of the effort yet there is danger if by chance it should pass in its original or modified form.

Manufacturers are urged to confer with their congressmen and senators on this bill.

The Anti-Trust Law

THE cotton-textile industry along with various other industrial organizations would like to see the anti-trust laws amended in such a way that the hazardous and extravagant and expensive cut-throat competition and unethical business pressures now active could be eliminated by some means of harmonious, lawful co-operation. There are, roughly, two kinds of anti-trust prohibitions. One against monopoly, and one against restraint of trade and unfair trade practices. This law was passed at a time when business was conducting itself in a very unethical manner, and industry is alleged to have been organizing itself to gouge the public, by creating scarcity and increasing unjustly prices that the public would have to pay for its commodities.

For the last three years our nation has been suffering from over-production and ferocious competition. The time has come when industry desires to organize, not for the purpose of taking any such undue advantage of the public, but that it may save itself from the awful practices that have been born during the last three years.

Recently 137 coal mining operators in the Appalachian mountain region of West Virginia, Virginia, Tennessee and Kentucky organized a sales agency called "Appalachian Coals, Inc." through which they proposed to distribute their output. They claimed many advantages for this sales agency in economies of organization, efficient distribution, elimination of companies that produced an expensive, unnatural and destructive competition.

This case was finally brought under the review of the Federal Courts and it was decided that such an arrangement gave to this company control over production and price, and that under the Sherman Act this constituted an illegal restraint of trade.

Business people who have hopes of modifying the Sherman law in such a way that business can cooperate on seemingly reasonable plans must not be too hopeful of success, because there is much poli-

tics in Washington, and there are always as many reasons why this legislation should not be modified as there are for its modification.

Under the new administration monopolistic abuses may be produced sufficiently strong to warrant the strengthening of the law rather than weakening it.

National Cotton Exhibit.

A NEW collection of representative cotton dress goods, renewed each season by the Cotton-Textile Institute, New York City, has just been installed in the U. S. National Museum at Washington to display the new fall fabric fashions. The exhibit of cotton materials, attractively draped in glass showcases, is on the same floor with the famous "Spirit of St. Louis" in which Lindbergh crossed the Atlantic, and includes 38 individual groups illustrating American skill in the production and styling of cotton for women's wear.

The cotton fabrics shown include prints, percales, varied meshes, crepes, laces, velveteens, corduroys, suitings, broadcloth, pongee, gingham plaids and checks, and representative novelty effects.

A check on the attendance, which is accurately registered by automatic machine counters, reveals that as many as 8,000 visitors have inspected the cotton display in a single day during the past year. Approximately 2,000,000 persons including many foreign visitors have viewed this educational exhibit of American cotton since the first display in the Spring of 1930. Museum officials state that this collection of cottons is a point of high interest and is the center of particular attention from hundreds of visitors from foreign lands who are continually passing through the museum.

"Definitions of Fair Trade Practices in the Sale and Purchase of Cotton Gray Goods for the Converting Trade."

IN 1910, a joint committee composed of representatives of the American Cotton Manufacturers Association and the National Association of Cotton Manufacturers formulated what was called a "Definition of Fair Trade Practices in the Sale and Purchase of Cotton Gray Goods," out of which grew certain definite trade customs that were organized in the sale and purchase of cotton gray goods up to 1931.

In the spring of 1931, a joint committee of the Association of Cotton Textile Merchants and the Textile Converters' Association prepared a slight revision of the rules and sent them out to the trade for their criticism or acceptance.

Since that time there has been more or less controversy over certain paragraphs. As a result of this controversy a committee from the American Cotton Manufacturers Association, headed by Elliott Springs, president of the Lancaster Cotton Mills, Lancaster, S. C., has been receiving protests of the southern manufacturers and has been conferring with the committee appointed by the Association of the Cotton Textile Merchants of New York, endeavoring to iron out these differences.

How soon the final acceptance of the completed code will be effected is dependent upon how long it requires to get the varying ideas of the manufacturers and others co-ordinated.

Any task of this kind naturally presents a great many problems, and although it is not intended to inject any new forms or practices the need to work out co-ordination, agreeable to all, makes its progress doubly delicate, inasmuch as merchants, converters and manufacturers see the same problems from different angles and a common ground must be attained.

The necessity for modifications of the code is simply an attempt to try to modernize its various paragraphs in keeping with the trends of business.

What the Southern Mills are Doing

E. M. H. RAYON MILLS and E. M. Holt Plaid Mills, Burlington, N. C., have completed the installation of 6,200 additional spindles manufactured by Fletcher Works, and are installing 104 Crompton & Knowles looms and a Standard-Trump Brothers knitting machine.

Installation of 36 new Crompton & Knowles looms has been completed by the Wade Manufacturing Co., Wadesboro, N. C.

Mooresville Cotton Mills, Mooresville, N. C., have installed 15 additional cards in the No. 2 plant.

New Machinery is being installed at the Catawba Cotton Mills, Newton, N. C., and the plant is to start up when this is completed.

Two boilers have been replaced at the Appleton Co., Anderson, S. C., where other improvements representing an expenditure of $100,000 have been made.

Joanna Cotton Mills, Goldville, S. C., have completed an additional one-story cotton warehouse with a capacity of 16,000 bales.

Rocky Mount Mills, Rocky Mount, N. C., are replacing all of their spinning with the long draft type furnished by H. & B. American Machine Co. The Wennonah Mills, Lexington, N. C., are installing 16,000 spindles of this long draft equipment.

At the Apalache plant of Victor-Monaghan Co., Arlington, S. C., one-process pickers have been installed, and new frames put in the card room.

Highland Park Mfg. Co., Rock Hill, S. C., will re-open on January 1st after extensive improvements now under way, and costing $100,000, have been completed.

A new power plant is being built at Pendleton Mfg. Co., LaFrance, S. C., including a new 300-hp. water tube boiler and a 125-foot stack. C. M. Guest & Son, Anderson, S. C., are the contractors.

It is reliably reported that the Goodyear Tire & Rubber Company will increase the capacity of the plants of their Goodyear Clearwater Mills at Cartersville and Cedartown, Ga., by the addition of a total of 24,000 spindles, which will be removed, it is understood, from the company's mill at Goodyear, Conn. It is understood that 10,000 spindles will be added at Cedartown, and 14,000 spindles at Cartersville. Provision had previously been made for these additional spindles, the report states, so that no additional building will be required for housing them. In addition to the two southern mills named, the Goodyear Tire & Rubber Company also operate a cotton mill at Rockmart, Ga., one of the Goodyear Clearwater group of plants manufacturing tire cord for the Goodyear company.

Comment on the Cotton Market

New Orleans, November 15th, 1932.

INCREASING crop ideas, subsequently confirmed by official returns, the recent further decline in securities and grain, due in part to the uncertainty then prevailing as to the outcome of the presidential election, the recent labor troubles in Lancashire, weakness in sterling, and hedging, tended to further depress the cotton market until of late.

Now that the uncertainty of the presidential election has been removed as a market influence, sentiment seems to be more cheerful, and as values for stocks and commodities are comparatively very low, there seems to be more disposition than to sell, especially by the trade, which is reflected in a moderate recovery in Wall Street, in sterling and in farm products. In stocks, cotton and grain there was much short covering recently which contributed to the late improvement in values.

Other developments that served to sustain and to create a change to a more cheerful feeling in sentiment was the recent lifting of the boycott in India against British cotton goods. The impression prevails that future developments, domestic and foreign, are likely to prove constructive. Compared with one month ago cotton values show only slightly lower.

GOVERNMENT CROP COMPARATIVES

As of November 1st—	This season	Last season	
Acreage for harvest, estimated	36,611,000	40,693,000	(final)
Indicated crop, bales of 500 lbs. gross weight	11,947,000	17,096,000	"
Indicated average yield per acre, lbs.	156.2	201.2	"

CENSUS GINNING REPORT

Bales—	This season	Last season
Ginned to November 1st, counting round as half bales	9,245,534	12,124,295
Ginned to October 18th	7,311,208	9,496,965
Ginned from Oct. 18th to Nov. 1st	1,934,326	2,627,330

SEASON'S INDICATED WORLD'S SUPPLY OF AMERICAN COTTON, LINT

Bales—	This season	Last season
World's carry-over, August 1st (Hester)	12,911,000	8,710,000
Indicated crop, bales of 500 lbs. gross weight gov. est.	11,947,000	17,096,000
Season's indicated world's supply	24,858,000	25,806,000

As to foreign crop prospects, a recent estimate as to the Egyptian was for a yield of 869,000 bales of 478 pounds net, against 1,288,000 last year. Members of the cotton trade at Bombay estimate the Indian crop, in bales of 478 pounds net, at 4,200,000 to 4,600,000 versus 3,400,000 last year. In Mexico and Brazil, the information received thus far, indicates some decrease in production during 1932-33 as compared with 1931-32. Reports on the Chinese crop continue to point to an increase of 40 to 47 per cent in production, which means a crop slightly larger than in 1930-31. In Russia, it is said, the crop may show some increase, but the indications are that this season's production will not increase to anything like the extent of some of the recent years.

Concerning domestic and British textile trade, returns for October were not as favorable as for September, nevertheless domestic October consumption was larger than for the previous month.

CENSUS REPORT

United States— Bales—	This season	Last season
Consumption of lint, October	502,244	461,023
Consumption of linters, October	57,955	62,315
Consumption including linters, October	560,199	523,838
Consumption of lint, 3 months	1,396,500	1,350,388
Consumption of linters, 3 months	166,883	188,391
Consumption including linters, 3 months	1,563,383	1,538,779
Mill stocks, October 31st	1,266,816	1,108,034
Stocks in public storage and warehouses, October 31st	9,826,875	9,460,691
Stocks in mills, public storage and warehouses, October 31st	11,093,691	10,568,725
Stocks in mills, public storage and warehouses, Sept. 30th	9,056,566	7,076,266
Active spindles during October	24,287,732	25,200,056
Active spindles during September	23,883,948	25,230,618

BRITISH BOARD OF TRADE REPORT FOR OCTOBER

Year—	1932	1931	1930
Exports of yarn, lbs.	11,000,000	13,000,000	12,000,000
Exports of cloth, yards	138,000,000	143,000,000	150,000,000

A feature of the Census report worthy of notice, as regards stocks in mills, public storage and warehouses, is that while they were 1,980,300 bales larger than last year at the close of September, they were only 524,966 bales larger than one year ago at the end of October. This development was due to the much smaller crop this year, resulting in lighter ginnings than last year, and to increasing domestic consumption. By the end of November it is probable that these stocks will be smaller than on corresponding date last year, and they may be much smaller than last season later on this season.

ASSOCIATION OF COTTON TEXTILE MERCHANTS OF NEW YORK OCTOBER STATISTICS

Yards—	October 4 weeks 1932	September 5 weeks 1932	October 4 weeks 1931
Production	253,109,000	284,956,000	227,116,000
Sales	149,657,000	292,410,000	333,679,000
Shipments	246,562,000	334,242,000	216,207,000
Stocks	166,668,000	160,121,000	255,833,000
Unfilled orders	347,123,000	444,028,000	344,639,000

October sales of domestic cotton goods were 59.1 per cent of production against 102.6 in September this year and 146.9 in October last year. Shipments were 97.4 per cent of production against 117.3 in September this year and 95.2 in October last year. Stocks at the end of October increased 4.1 per cent against a decrease in September of 23.5 and an increase in October last year of 4.5 per cent. Unfilled orders decreased 21.8 per cent against a decrease in September of 8.6 and an increase in October last year of 51.7.

August 1st to November 11th— Bales—	This season	Last season
In sight (marketed)	6,451,000	7,608,000
Exports to Great Britain	418,000	281,000
Exports to the Continent	1,567,000	954,000
Exports to Canada	46,000	58,000
Exports to the Orient	491,000	933,000
Total exports	2,522,000	2,226,000
Spinners takings of American—North and Canada	372,000	378,000
South	1,462,000	1,489,000
Foreign, exclusive of Canada and Orient	1,433,000	1,170,000
Orient	680,000	767,000
Total takings	3,947,000	3,804,000
World's visible supply of American, November 11th	9,674,000	9,249,000
Of other kinds	1,638,000	1,844,000
Of all kinds	11,,312,000	11,093,000

An encouraging feature of the situation is that exports from the United States to November 11th to Great Britain and the Continent were much larger than for the corresponding period last season, and the same applies to Europe in a measure as regards takings of American thus far this season. Exports from the United States to the Orient, however, show much less than for corresponding time last season, but, as noted above, takings of American to 11th inst. by the Orient make a better showing than do exports to the Far East, denoting mills in those parts to be drawing on their reserves to some extent.

This is an encouraging situation as concerns the probability of a larger, perhaps a much larger consumption of American lint cotton by the world this season than last season's, which, according to Secretary Hester, was 12,580,000 bales.

As to America, there has been a steady increase from month to month for sometime past, which bids favorable for the future. This year consumption of lint cotton in the United States, that is since last July, was as follows: For July 278,656; August 402,601; September 491,655 and for October 502,244 bales. It seems that King Cotton will aid, if not lead in lifting the country out of the depression.

Late advices from interior are to effect that the basis remains firm and the tendency is towards a higher basis. The holding movement goes on but to a somewhat lesser extent. It is said that the demand from mills in the United States continues steadily but not urgently, and that an unexpected demand has developed in the Far East during the past three weeks, with reports that Japanese mills have booked very large orders. The demand from Europe, while not persistent is, nevertheless steady and in moderate quantities, which indicates a hand to mouth policy of buying. Altogether, it is stated, the condition is healthier.

New Textile Equipment and Publications

New "Compensated" Belt.

The Manhattan Rubber Manufacturing Division of RaybestosManhattan, Inc., Passaic, N. J., have recently introduced an important addition to the Condor textile line of rubber goods, the "Compensated" belt, on the design of which patents are pending. The manufacturers point out that ths new belt is compensated or counterbalanced to offset the severe operating conditions to which belts are subjected. It is built to overcome the problem of greater strains on the outside of the belt experienced with flat belts operated around the pulleys, especially those small in diameter. The construction of

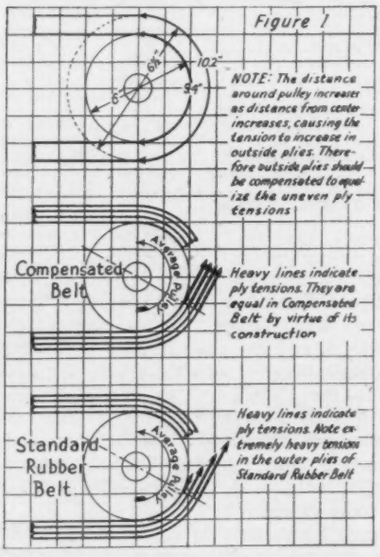
Figure 1
102"
94"
NOTE: The distance around pulley increases as distance from center increases, causing the tension to increase in outside plies. Therefore outside plies should be compensated to equalize the uneven ply tensions
Compensated Belt
Average Ply Tension
Heavy lines indicate ply tensions. They are equal in Compensated Belt by virtue of its construction
Standard Rubber Belt
Average Ply Tension
Heavy lines indicate ply tensions. Note extremely heavy tensions in the outer plies of Standard Rubber Belt

the belt is such as to equalize the stresses in each ply of the belt. It is pointed out that when the belt is bent over a pulley, the outside ply of the belt is subjected to greater stress due to increased circumference of the ply while passing around the pulley; and that the compensated belt is constructed to overcome the faults of rupturing of the outside ply; so, it is pointed out, by reducing the ply stresses while flexing, the life of the belt is prolonged, since only a portion of the maximum ply stress on a belt comes between the pulleys, and the maximum ply stress is at the small pulley. The manufacturers offer the accompanying illustration, showing that the outside plies in the new belt, which would be ordinarily subjected to greater stress than the inside plies, are compensated to distribute the ply evenly to all plies and to conform to the pulley without excessive or uneven stress on any one ply.

This construction, it is claimed, results in several advantageous features; longer fastener life is claimed, because "the tendency for fasteners to work loose and pull out has been eliminated by equalizing the tension of the outside duck ply with that of the inside duck ply, so that each ply in the belt holds the fastener with equal grip and ply tension. Increased flexibility resulting from the new construction, it is explained, permits the use of smaller pulleys, without excessive slip. Inasmuch as the trouble of ply separation usually begins in the outer ply, the new construction has minimized this difficulty, "since stresses are evenly distributed in all plies and there is no tendency for one ply to move over another."

Another feature of the new belt is that of a high coefficient of friction or pulley adhesion on the pulley side of the belt, permitting it to be run at lower tension, or more loosely to transmit the same power. This, it is pointed out, makes for uniform efficiency regardless of atmospheric conditions, reduced bearings, shafting and hanger troubles, etc. The belt may be made endless, using the patented extensible tip.

:: :: ::

An Instrument to Record and Control Idle Time.

The Chronolog is a new instrument designed for the recording of idle time on machinery and processes, as well as showing a record of productive time and units produced. The device was developed and is being built by the National Acme Company of Cleveland, Ohio, and is being marketed by the Graybar Electric Company. The instrument, shown herewith, is applied by cable to the machine, and is energized by the ordinary lighting circuit. It gives a visible record throughout the day of idle time, in minutes, that has accumulated; of productive time; and a count of the units produced. When the machine is shut down for any cause, the operator registers that cause by dialing the symbol letter corresponding with the reason for shutdown indicated on a symbol chart attached to the instrument, and at the same time a red signal light goes on. In addition to keeping the operator constantly informed, the instrument presents a detailed printed record called the "Chronorecord" which shows when interruptions occur, why they occur, and how long a delay is involved; any desired number of these cards may be produced, summarizing the total idle time, total productive time, and units produced, or the time keeper, time study production and other departments.

—to record idle time.

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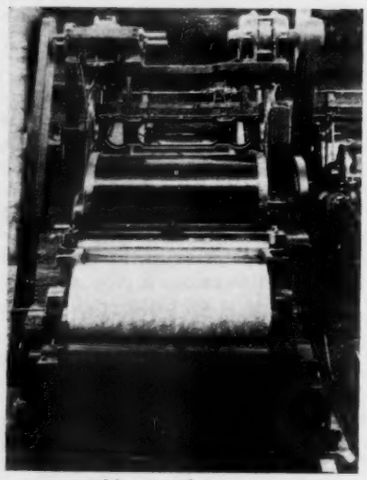
Variable Speed Transmission on One-Process Picking.

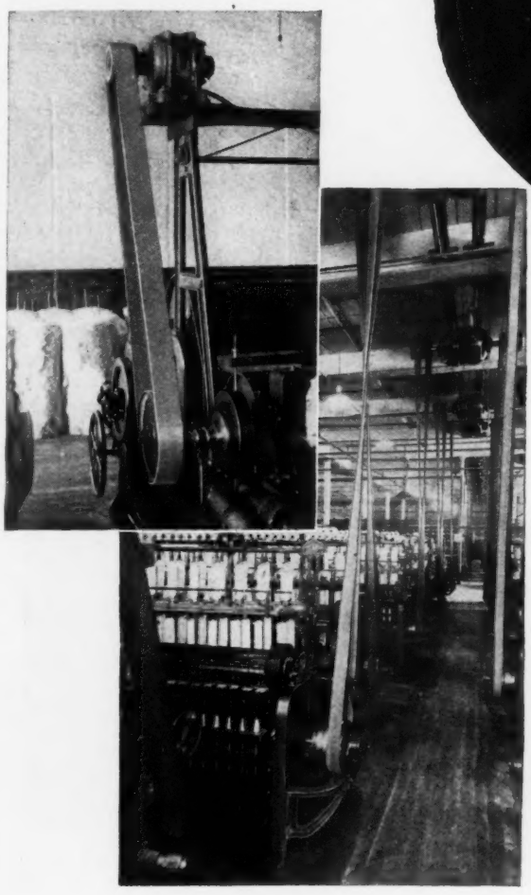
The accompanying photograph illustrates the recent application by Reeves Pulley Company, Columbus, Indiana, of the Reeves variable speed transmission with mechanical automatic control to one-process pickers. It will be noted that the transmission equipment is



—variable speed on one-process.

mounted on the A-frame of the picker, and it is used in the place of cone pulleys. The extended lever of the Reeves transmission is connected to the evener motion, which operates the lever to increase or decrease the speed of the machine. The company points out that the transmission may be applied to the picker to regulate the speed of either the feed roll or the calender rolls, depending upon the system of one-process picking in use. In the installation

There is No Substitute for Experience



All Goodyear products are constantly under development and test for further improvement. Each new advance is completely mill- or mine-proved when offered for industrial service.

SOMETHING much more valuable to you than even the best of rubber and the strongest of cotton cord is built into Goodyear Belts for textile drives.

It is the intimate knowledge which Goodyear has of textile mill requirements, gained from actual experience in Goodyear's own large fabric mills.

How to design and how to build belts that will be subject to an absolute minimum of stretch, that will resist fraying under shifting, that will not rip or split at the center — these are a part of Goodyear experience, built into Goodyear belting, and available to you at no premium cost.

For example, Goodyear COMPASS (Cord) Endless Belt is the most nearly stretchless belt made. It is truly endless, made of cords laid side by side, bound with Goodyear rubber, and enclosed in a fabric envelope that is double on the pulley side. The cord carries the tensions; the cover takes the wear. An exceptionally serviceable belt for individual motor drives in Vertical Openers, Pickers, Tappers and Twisters.

Other specially designed and constructed Goodyear Belts are recommended for long wear and low replacement costs on Cards, Frames, Slubbers, Spoolers, Looms, Slashers and Breakers.

Why not talk with the G. T. M. — Goodyear Technical Man—about the belt equipment he has specified for many mills, assisting their operations and saving them money? He will call promptly at your suggestion. Write to Goodyear, Akron, Ohio, or Los Angeles, California.

TEXTILE BELTING

THE GREATEST NAME IN RUBBER

GOODYEAR

shown, the Reeves transmission is used to regulate the speed of the calender rolls.

:: :: ::

Motor Reduction Unit.

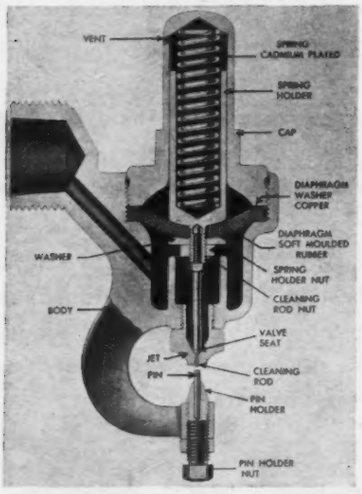
Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin, have announced the development of a motor reduction unit for use where low speed drives are required. A standard round frame type motor is mounted directly on the gear reducer housing; helical gears are used. Standard speeds at the power take-off are from 3.02 r.p.m., to 380 r.p.m., but lower speeds can be provided; 6.08 r.p.m. is obtained with the use of 1,750 r.p.m. motor. The bearings supporting the gear drives are ball or roller type; lubrication is automatic; standard units are arranged for floor mounting but units can be supplied for wall, ceiling or vertical mounting—and standard squirrel cage induction motor, wound rotor type, enclosed fan-cooled, explosion proof, or direct current type may be supplied.

:: :: ::

New Self-Cleaning Humidifier Nozzle.

American Moistening Company, 260 West Exchange St., Providence, R. I., have developed the Amco self-cleaning humidifier nozzle, which is illustrated in cross-section herewith, with the various parts of the nozzle marked.

It is explained that this new nozzle, designed to be quickly installed in the place of existing nozzles and requiring no change in fittings, connections, etc., automatically cleans the nozzle orifice by mechanical movement each time the water supply to the humidifier is shut off, either by hand or automatic humidity control action; thus providing a constant delivery of water. Reference to the illustration will explain the operation of the nozzle. With water pressure on, this pressure acts on the rubber diaphragm to reverse its natural position, thereby lifting the cleaning pin from the orifice channel. With the water pressure relieved, the diaphragm assumes its natural position, forcing the cleaning pin into the orifice channel, and in that movement, all accumulated dirt and foreign matter is carried to the base of the orifice where it is picked up by water in transit upon resumption of the water pressure.



Self-cleaning humidifier nozzle.

A valve effect is provided which operates to prevent dripping from the nozzle of any free or spent water; a tapered facing and seat on the pin and in the jet arrests water delivery.

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Improved Automatic Straightaway Tenter.

The Textile Finishing Machinery Company, Providence, R. I., have announced a new automatic straightaway tenter, designed particularly to accomplish more efficient tentering at present high speeds and even higher speeds if desired, it is stated.

The driving mechanism is so designed as to be practically a separate, self-contained unit to which the rails are merely attached. The company points out that, "the ultimate benefits derived from this feature include elimination of vibration and a longer life for the driving sprocket and chain, removing also any unnecessary strain on the main drive and shaft except the natural turning effort." All driving parts of the tenter turn in ball bearings; the gears driving the sprocket heads are enclosed in cast-iron housings rigidly supported on the cross rails; the main driving shaft turns in SKF ball bearings and runs in an oil bath; cut spiral bevel gears are used.

A balanced mechanism for adjustment of the chain rails, electrically operated by push-button control mounted on the cross rail, is designed to give freedom from binding of the drive shaft during the adjustment of the rails for different widths of cloth. This arrangement may be operated either while the machine is running or while it is stopped. A lubricant retaining flange is provided about the end of the tenter rail. The whip of the chain around the ends has been eliminated, it is explained, not only making it possible to obtain higher speed, but eliminating breakage of tenter links and reducing the wear on rivets. The tenter occupies less floor space than previously. The main drive is available either with motor and enclosed silent gearing, silent chain or v-belt drive.

The Textile Finishing Machinery Company also recently announced that they had signed an agreement with the Roessler & Hasslacher Chemical Company of New York City to build their patented kier for bleaching with peroxide.

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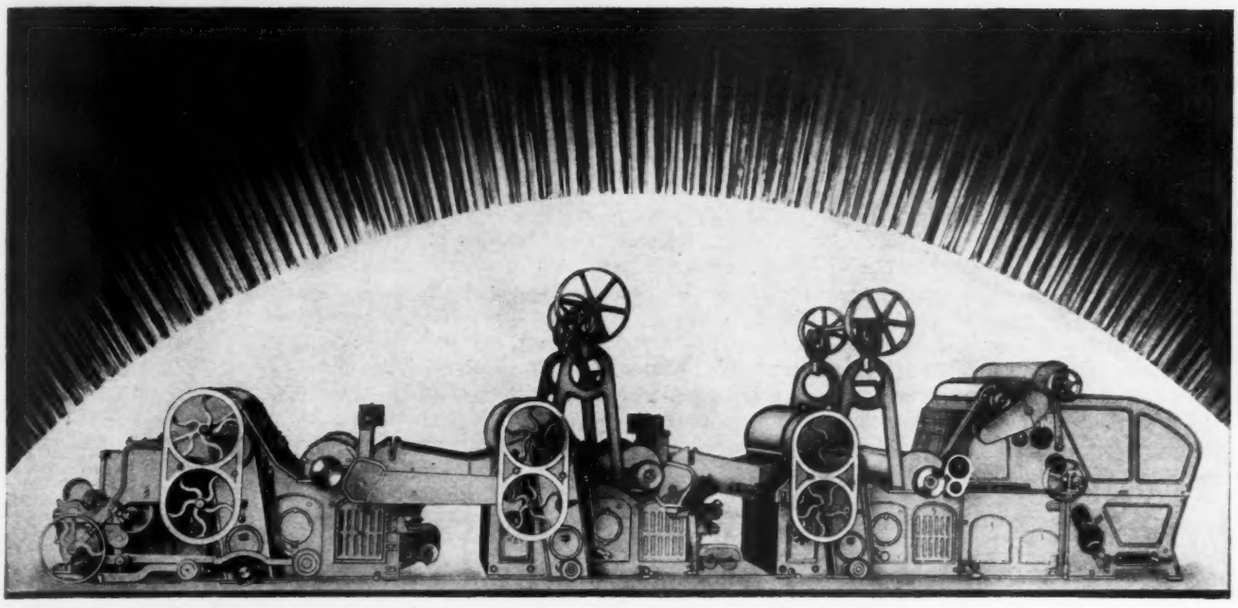
Nickel-Clad Steel Available in New Finish and Wider Size Range.

Nickel-clad steel, a joint development of the International Nickel Company and Lukens Steel Co., produced at the latter company's mills at Coatesville, Pa., is a hot-rolled bi-metal made up of a light layer of pure, solid nickel bonded to a heavy layer of flange quality steel. The nickel layer, which can be of variable thickness as desired up to 20 per cent of the total plate thickness, provides, the makers explain, "the corrosion-resistance and other advantages of pure solid nickel construction without prohibitive price in heavy units of equipment."

The Textile improved straightaway tenter . . .

The makers continue: "Up to the present time, nickel-clad steel has been available only in the regular hot-rolled finish, the nickel surface of which carries the tightly adherent nickel oxide film, dark olive brown in color. This nickel oxide finish is formed during the rolling of the bi-metal at high temperatures, and is somewhat similar to the finish on standard hot-rolled steel plates. * * * Now a new finish, classified as "hot-rolled and cleaned', is available, free from the brown nickel oxide on the nickel side. The cleaning process gives the nickel a matt appearance nearly white in color, with surface superior to that produced by standard plate-mill practice. This 'hot-rolled and cleaned' finish, however, should not be confused with the bright, lustrous sur-



Photograph of Picking Equipment installed in 1916 and converted into H & B A-1 One-Process System in 1932.

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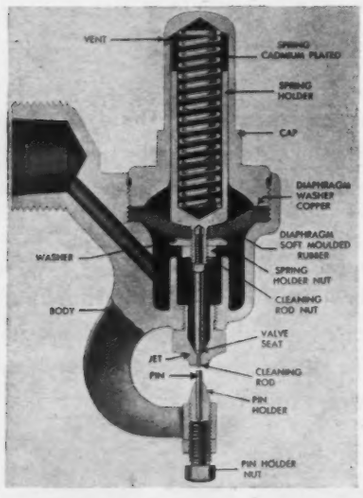

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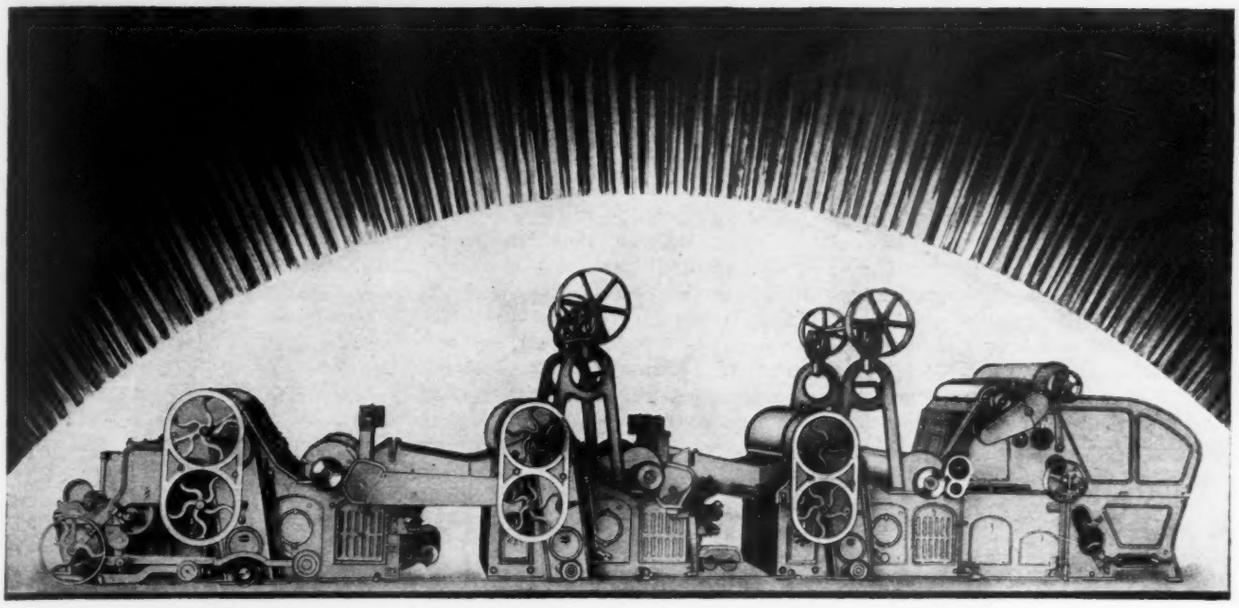

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COTTON PREPARATORY AND SPINNING MACHINERY

face of cold rolled and full finished solid nickel sheet, where refinement is obtained by cold rolling." Nickel-clad steel is also now available in rectangular plates and circles in a wider range of sizes than heretofore, it is announced.

:: :: ::

Stroboscope for Textile Use.

A stroboscopic instrument, the Vibroscope, especially adapted for examining and counting the speed of spindles in textile mills, has been developed by Electrocon Corporation, 6 Varick St., New York City. This instrument operates on the well known principle that if a body in motion is illuminated by a succession of instantaneous light flashes timed to occur in perfect synchronism with the motion, the body will appear to be perfectly stationary. The reason for this is that each flash of light gives the observer a glimpse of the moving body in exactly the same posi-

New Textile Stroboscope.

tion in its cycle of operation and the eye retains the image of the body in this position from one glimpse to the next. If the light flashes are so timed that they are slightly out of synchronism with the motion, then the body will appear to be moving at greatly reduced speed, as in a "slow motion" picture.

The Vibroscope is built into a strong metal box which may be supplied on a wheel chassis for convenience (a small chassis being designed to allow passage through spinning and other alleys) or in a portable case. The box contains a variable speed motor and the necessary electrical parts for flashing the Neon tubes. The handlamp carrying the Neon tubes is strapped to a shelf on the chassis and held in the operator's hand when in use. A tachometer is mounted on the motor shaft when the instrument is to be used for speed counting. The speed range on the standard models is from 1,200 r.p.m. to 8,000 r.p.m., permitting accurate counting of spindle speeds of twice that. The instrument operates from 100-120 volts a.c. supply. Different models carry two or three Neon tubes as desired.

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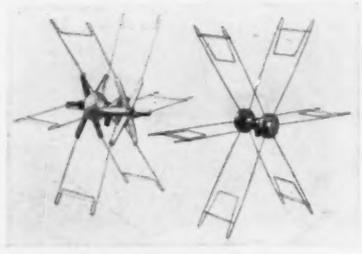
Atwood Wire Swifts.

Atwood Machine Co., Stonington, Conn., recently introduced two new wire swifts—the Ideal adjustable swift and the Simplex nonadjustable swift. These swifts, it is pointed out, are constructed of rust-proof tempered steel and are practically unbreakable; they are fitted with cotton bands which provide a rest for light silk and rayon



Two new swifts.

yarns. Six or nine arm swifts are furnished in various sizes, to hold skeins of 42 to 84-inch circumference. The Ideal swift is adjustable; a twist of the wrist collapses the swift to receive a skein or expands it to receive a skein.

The Atwood Company also recently issued a new bulletin entitled "The Care and Lubrication of Spindles", outlining in detail the commonsense essentials of good spindle up-keep. The bulletin also describes the Atwood "Ball Top" spindle. The bulletin refers to spindles on silk and rayon throwing machinery as manufactured by this company.

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Fully Automatic Water Softener.

A new fully automatic industrial zeolite water softener has been announced by the Permutit Company, 440 Fourth Ave., New York City, which, it is explained, eliminates errors due to the human element and conducts the operations of softening and regeneration automatically. A combination is used of a meter-operated switch and electric controls with a motor-driven Permutit single valve. At the end of the softening run, the meter actuates the electrical control which carry through the steps of: cutting the softener out of operation; backwashing it for a regulated period, admitting a carefully regulated amount of saturated salt brine; rinsing out the hardness salts; and throwing the softener back into service, thus placing it again under the control of the meter, which governs the volume of water to be softened during the next softening run and initiates the start of the next regenerating cycle. The automatic control may be applied simply, it is stated, to existing downflow softeners, as well as on new models.

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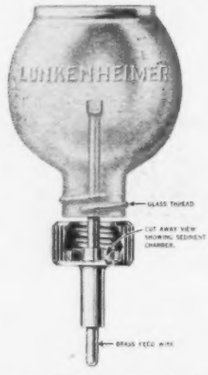
New Bottle Oiler.

The Lunkenheimer Company, Cincinnati, Ohio, is marketing a new design of bottle oiler, made up of three major parts—glass bottle with threaded neck,



bronze base with integral sleeve type shank, and brass feed wire. A thick resident cork washer seals the joint between bottle and base. This type of oiler is entirely automatic, feeding only when the shaft is in motion.

:: :: ::

Extensible Tip Devised for Endless Rubber Fabric Belts.

Patents have recently been granted to the Manhattan Rubber Manufacturing Division, Raybestos-Manhattan, Inc., Passaic, N. J., on an extensible tip for endless fabric belts. The operation is applied to the outside plies of the belt before the two ends are interlapped and made endless. It consists of a series of perforated holes in the outside plies which are made with a punch. Into these holes, tie-gum is pressed and the rest of the union interlapped, cemented and vulcanized in the usual fashion. It is explained that the perforations, which are filled with pliable tie-gum, allow more than the usual extension of the splice when it bends around small pulleys. The extensible tip is designed to eliminate splice separation, and, it is claimed, many hours are added to the life of the belt splice.

:: :: ::

Catalog on Cog-Belt Drives.

Dayton Rubber Manufacturing Company, Dayton, Ohio, has prepared a new condensed catalog on Dayton Cog-belt drives. It is known as Catalog No. 105 Condensed, and, it is stated, provides brief data for office use as well as a convenient hand-book on v-belt drives, including dimensions as well as simplified data for the calculation of special drives.

"FIFTEEN MONTHS' WORK IN ONE YEAR"

That is what Tubize Chatillon Corporation now accomplishes through Teletypewriter Service, says J. E. Bassill, President

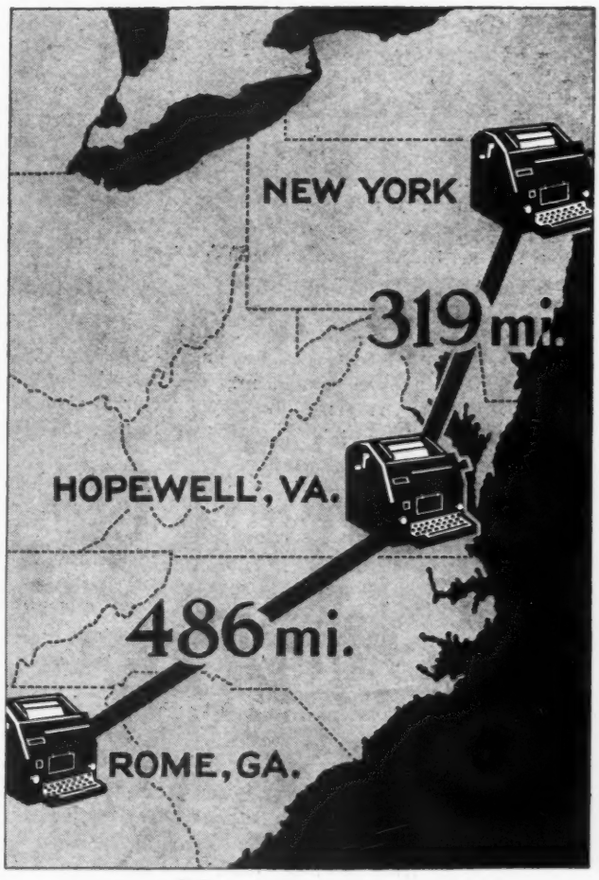
THREE officials of Tubize Chatillon Corporation agree that Teletypewriter Service — typing by wire — has helped that company *cut costs*, *increase efficiency* and give *better service* to customers.

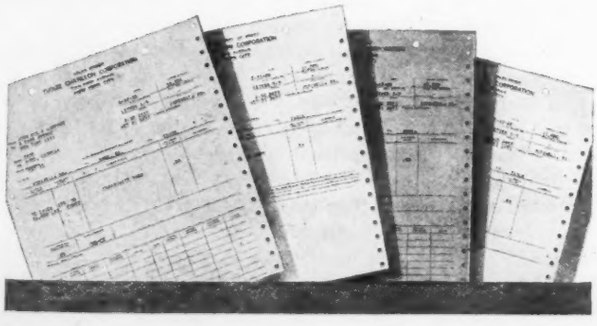
The President says: "Entirely aside from the tremendous help which they render in the prompt and efficient transmission of orders to the plants and the consequent betterment of service to our customers, our experience is that it is possible to accomplish fifteen months' work in one year by the use of teletypewriters."

The Vice President in Charge of Sales, H. N. Cappel, says: "With the conservative manufacturing and purchasing policies prevailing recently, prompt delivery of raw material has been paramount. The hundreds of miles between our plants and sales offices have been reduced to a split second through the installation of teletypewriters."

The Purchasing Agent and Traffic Manager, R. C. Jones, says: "Teletypewriters let us take advantage of market conditions affecting commodity prices, and expedite shipments of supplies, resulting in a reduction of our inventory of maintenance stocks."

Teletypewriter Service is considered by many companies in the textile field as the economical means of connecting their branches whether 300 feet or 3000 miles apart. Without charge, your local Bell Telephone Company will gladly show you how this modern business aid may be applied to your operations. Just call the Business Office.





Teletypewriter form-writing equipment makes it possible to reproduce duplicate forms on all connected machines. Details such as weight, description, grade, price, shipping and billing information—typed on order forms on the sending machine—are accurately reproduced in the same positions on similar forms at connected machines. This feature alone has enabled Tubize Chatillon Corporation to make large savings.

NEWS ITEMS *with a Textile Slant*

White and Burgess Form Company.

G. A. White & Company, Box 533, Charlotte, N. C., are the southern distributors for the International Moistening Company, and the Southworth Machine Company, handling atomizers

G. A. White.

Frank Burgess.

and humidifiers, and also handle the Foxboro humidity recorder controller. This company is composed of George White and Frank Burgess, both of whom have had long experience in the humidifying business. They carry a stock of humidifiers and controls, and also pumps and compressors, dealing in both new and used equipment.

:: :: ::

Changes in Butterworth's New England Organization.

H. W. Butterworth & Sons Co., have announced, with regret, the resignation of Arthur C. Freeman, Sr., vice-president and member of the board of directors of the company, and also the resignation of Arthur C. Freeman, Jr. For many years Mr. Freeman and his son, together with Thomas W. France, have been identified with the New England office of H. W. Butterworth & Sons Company, located at Providence. This office is now under the direction of Mr. France, with J. Ebert Butterworth and DeHaven Butterworth making frequent trips into the New England territory from the home office in Philadelphia.

:: :: ::

Howard Represents Mundet.

Mundet Cork Company, manufacturers of cork products, have announced the appointment of C. R. Howard, 408 Hillcrest Avenue, Charlotte, N. C., as their distributor in North and South Carolina. Mr. Howard will carry full line of insulation, namely, sheet cork, cork pipe covering, cork machinery isolation and cork isolation mats, as well as cork tile flooring.

Booklet on Variable Speed Spinning and Twister Frame Drives.

Reeves Pulley Company, Columbus, Indiana, have distributed a booklet, S-300, which provides the results of operating tests conducted on the new Reeves variable speed spinning and twister frame drive in several southern textile mills. Mill figures in various tests with this drive, as well as a description of its operation, are included in the booklet.

This company is also distributing its first complete catalog of the Reeves variable motor pulley—Catalog V-200. This describes completely the design, operation and uses of this variable speed unit for light horsepower requirements.

:: :: ::

Booklet on Fade-Ometer.

Atlas Electric Devices Co., 361 West Superior Street, Chicago, Illinois, have prepared and are distributing Bulletin No. 32 covering the type FDA Fade-Ometer, which is described as a real step forward in predetermining the light fastness of colors. A clear description of the new type of Fade-Ometer is given, together with full information concerning it.

:: :: ::

Davis Has Truck Account.

George P. Davis, Builders Building, Charlotte, N. C., has been appointed representative of the two Carolinas for the Nutting Truck Co., Faribault, Minnesota. This concern manufactures a complete line of floor trucks, casters and trailers.

:: :: ::

Texdrive Calculator.

W. A. Meyer of the Texrope Division of the Allis-Chalmers Mfg. Co., Milwaukee, Wisconsin, has advised us of a new idea, a Perry-Graf instrument for instantly selecting the proper Texrope drive for any installation, no tables, slide rule or calculation being necessary. Only a dial is turned and the drive, with the catalog number and price, is indicated. Suppose, for example, it was desired to find a drive that would run a machine at 500 r.p.m. and deliver 25 h.p., with a motor with a full load speed of 760 r.p.m., one turn of the calculator would give the answer, showing simultaneously the diameters of the driver and driven wheels, number of Texropes, size Texropes, choice of center distances, with Texrope, for each horsepower of the drive, catalog number of the drive, and the price. The calculator was developed after extensive study and cooperation between W. A. Meyer and other Allis-Chalmers officials, and the Perry-Graf Company of Chicago.

:: :: ::

New Book on Steam Traps.

Armstrong Machine Works, Three Rivers, Michigan, have completed a new manual on steam trap engineering, containing complete information on the Armstrong line of traps. It is intended that with the aid of this book, the proper steam trap may be selected for cooking kettles, steam engines, separators, laundry machines, unit heaters, water heaters, textile machinery, etc., etc. In addition to these and other applications, the book contains a special section on draining water from compressed air lines, separating different liquids, improving refrigerator systems, and trapping acids and other chemicals.

:: :: ::

Textile Research: A Survey of Progress.

A new book published under the title, "Textile Research: A Survey of Progress" is aptly and succinctly described as being "the story of what textile research is, what it is doing and what it may do'.' It comprises 22 chapters by prominent men in different phases of textiles, edited by the board of editors of the U. S. Institute for Textile Research, 65 Franklin St., Boston, Mass., under whose auspices the work was published and to whose first president, the late Dr. S. W. Stratton, it is dedicated.

Among the chapter headings are: Physical Testing, by H. J. Ball; Chemical Analysis, by J. F. X. Harold; Dye Chemistry and Application, by L. A. Olney; Application of Optical Equipment to Textile Research, by E. R. Schwarz; Textile Microbiology, by B. E. Proctor; Technology of Cotton Manufacture, by H. H. Willis; Cotton Fiber Research, by Ruby K. Worner; Drycleaning, by Pauline Beery Mack; and Technology of Woolen and Worsted Manufacture, by E. D. Fowle.

The main objective of the book is to demonstrate the possibilities of research in the textile industry. With the articles just listed, and the book's voluminous references and an index of abstracts published in the Institute's monthly bulletin during 1931, it is an important reference book for those interested in research in textiles.

The book contains 286 pages and 32 illustrations. The price is $2.50 per copy, and it may be obtained from the Institute or through COTTON's book department.

Prompt Service to

A recent installation of "Monarch" Twisters.

Increase Production

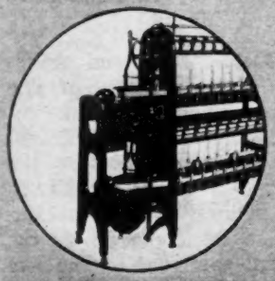
If you need greater production—quickly—our adequate stocks and knowledge of operating conditions make possible quick shipment of new machines and repair parts.

Perhaps your particular problem is best solved by double decking—or by adding modern features—or by rebuilding present machines into new Atwood types. You will be surprised how quickly and effectively and at what a low cost this can be accomplished.

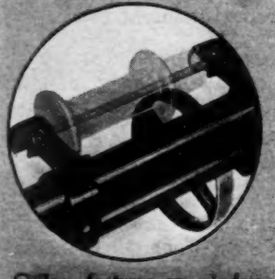
Whatever your needs—with unexcelled engineering and manufacturing facilities developed exclusively for throwing machinery, Atwood offers prompt shipment of dependable products, backed by Atwood's guarantee of quality.

Atwoods engineers have met the most exacting needs of several generations of throwsters. Atwood experience is available for the prompt solution of your throwing problems.

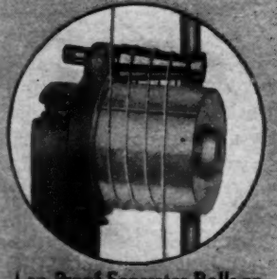
A few of the many modern Atwood features which may be incorporated in your early Atwood machines.



Early types of Atwood Twisters can be rebuilt into the modern "Utility" type.



Oilless features on winders insure cleanliness.



Lap Proof Separator Rolls on "5B's" eliminate roller laps and increase output.

THE ATWOOD MACHINE COMPANY

FOUNDED 1852

ATWOOD **STONINGTON, CONN., U. S. A.** ATWOOD

Sales Offices: New York Wilkes Barre, Pa. Stonington, Conn.
Charlotte, N. C. Los Angeles, Calif.

ATWOOD MACHINES THROW THE BULK OF AMERICA'S SILK AND RAYON

2356

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

HOWARD E. COFFIN, of Sea Island Beach, Ga., one of the nation's prominent executives and financiers, is to be the executive head of the re-organized company resulting from the liquidation of the Hunter Manufacturing & Commission Co., following a vote of stockholders at a meeting in Greensboro, N. C. Mr. Coffin, a pioneer in the motor car and aeronautical industries, was for 20 years vice-president and consulting engineer of the Hudson Motor Car Company, and was, with Edsel Ford, an organizer of the country's first comprehensive effort in commercial aviation, National Air Transport, Inc., serving two years as its president and two years as chairman of its board.

HAROLD P. GOLLER has been appointed southern representative of The Arkansas Company, Inc., 233 Broadway, New York City, manufacturers of a full line of textile chemicals. His headquarters are in Greenville, S. C. Mr. Goller, a graduate of the Lowell Textile Institute, located in the South a number of years ago as representative of the Dupont Rayon Company. He has since been calling on the textile plants throughout the South and enjoys a wide acquaintance among them.

GORDON F. SPENCER, who for three years was departmental superintendent of gray, bleached, mercerized and white goods department of the Rock Hill Printing & Finishing Co., Rock Hill, S. C., has taken a similar position at the Ware Shoals Mfg. Co., Ware Shoals, S. C.

N. BARNARD MURPHY has been made general manager of The Trion Company, Trion, Ga. For some years he has been superintendent, and recently A. D. ELLIOTT was made superintendent of the cotton mill, and C. L. DUNN is superintendent of the glove plant. Mr. Murphy has supervision of all of the properties at Trion.

W. IRVING BULLARD has retired as vice president of the Central Republic Bank & Trust Co., Chicago, and will devote his time temporarily to his eastern textile interests, including the E. H. Jacobs Mfg. Co. and the Williamsville Buff Mfg. Co., both of Danielson, Conn. He is treasurer of both companies.

JOHN A. CURTIS has been appointed manager of the Newark, N. J., office of Willcox & Gibbs Sewing Machine Company. Mr. Curtis has been identified with the Newark office for more than ten years.

E. A. SMITH is president of the Phenix Mills, Inc., Kings Mountain, N. C., following the re-organization and sale of the mill to Wilson & Bradbury, Inc., of New York and Philadelphia, selling agents. E. A. HAMRICK, of Shelby, N. C., is vice-president, secretary and general manager, and C. D. THOMS, of New York City, is treasurer. J. L. RHINEHARDT is superintendent; J. N. JONES, general overseer of carding and spinning, assisted at night by JOE DUNCAN; B. H. BRIDGMAN, general overseer of weaving, assisted at night by CARL HUGHES; W. E. CULBERSON, overseer cloth room; and W. E. OWEN, master mechanic.

A. L. FREEDLANDER, vice president and factory manager of The Dayton Rubber Manufacturing Co., Dayton, Ohio, rode the Graf Zeppelin from South America to Germany recently. Mr. Freedlander had been in South America investigating the possibilities and development of rubber plantations in the Latin American countries. In Europe he conferred with leading engineers in regard to recent developments in the manufacture of Dayton cog-belt drives and other products.

T. H. BURKHARDT has been appointed vice-president of Burlington Mills, Inc., Burlington, N. C. For the past several years he has been in charge of mills and technical expert and consultant to the officials.

STUART F. BROWN, treasurer and manager of the Whitinsville Spinning Ring Co. and Mrs. Brown were passengers for England on the Britannic from Boston on November 19th. While abroad Mr. Brown plans to confer with Eadie Bros. & Co. of Paisley and Manchester under whose license the Whitinsville Spinning Ring Co. are manufacturing the new self lubricating spinning and twister rings in the United States and Canada.

O. R. JOHNSON has resigned as superintendent of weaving at the Brookside Mills, Knoxville, Tenn., and returned to his former home in Greenville, S. C. He is succeeded at Brookside by A. Ashton, of New Bedford, Mass.

JOHN KLINCK has been transferred from superintendent of The Sibley Mfg. Company, Augusta, Ga., to superintendent of Enterprise Mfg. Co., operated by the same organization. D. R. SENN, whom Mr. Klinck succeeds at Enterprise, has been placed in the mechanical department of the two organizations. WALTER DILLARD, JR., who has been assistant superintendent at Sibley, succeeds Mr. Klinck as superintendent there.

J. L. BOBO has become overseer of slashing and weaving at the Easley Cotton Mills No. 3, Liberty, S. C.

J. M. HOPPER has become overseer of weaving at the Virginia Cotton Mills, Swepsonville, N. C., succeeding TOM COBLE. Mr. Hopper was formerly overseer of weaving at the Burlington Mills, Inc., Burlington, N. C., where he is succeeded by STEVE DAVIS.

Obituary.

A. P. RHYNE, a pioneer cotton manufacturer of North Carolina, died recently at his home in Mount Holly, N. C., at the age of 89 years. Mr. Rhyne, after a brief career as merchant, bought the Woodlawn Mill, Mount Holly, in 1873; organizing later the Tuckaseege Mills and the Albion Mills. He was vice-president of the American Cotton Manufacturers Association, 1897-1899. He is survived by two brothers, one of whom is DANIEL E. RHYNE, of Lincolnton, N. C.

FLEXIBILITY
of Great Importance Today

▼

1. Barber-Colman *Improved* Automatic Spoolers are capable of running *four counts* of yarn on one machine at the same time.

2. Barber-Colman *Super-Speed* Warpers can be changed from one count to another *without loss of time.*

3. Barber-Colman *Super-Speed* Warpers can be creeled for stripe work with no loss of time; the pattern can be changed for each beam as simply and easily as though it were repeat work.

4. Barber-Colman *Improved* Machines can handle fine yarns as well as coarse.

5. Barber-Colman *Improved* Machines reduce the amount of time required to handle short orders.

▼

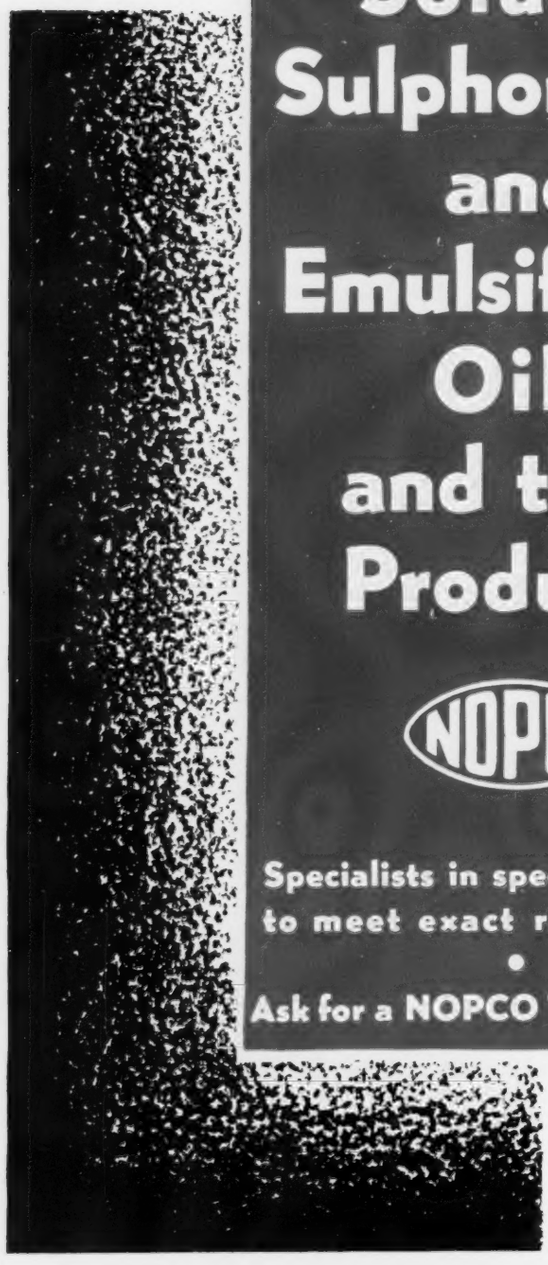
Barber-Colman Improved Machines
are FLEXIBLE

▼

BARBER-COLMAN COMPANY

General Offices and Plant ROCKFORD, ILLINOIS

GREENVILLE, S. C. FRAMINGHAM, MASS.



All Soluble Sulphonated and Emulsifiable Oils and their Products

NOPCO

Specialists in specific formulae to meet exact requirements

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Ask for a NOPCO Technical Man

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Boston
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HARRISON, N. J.

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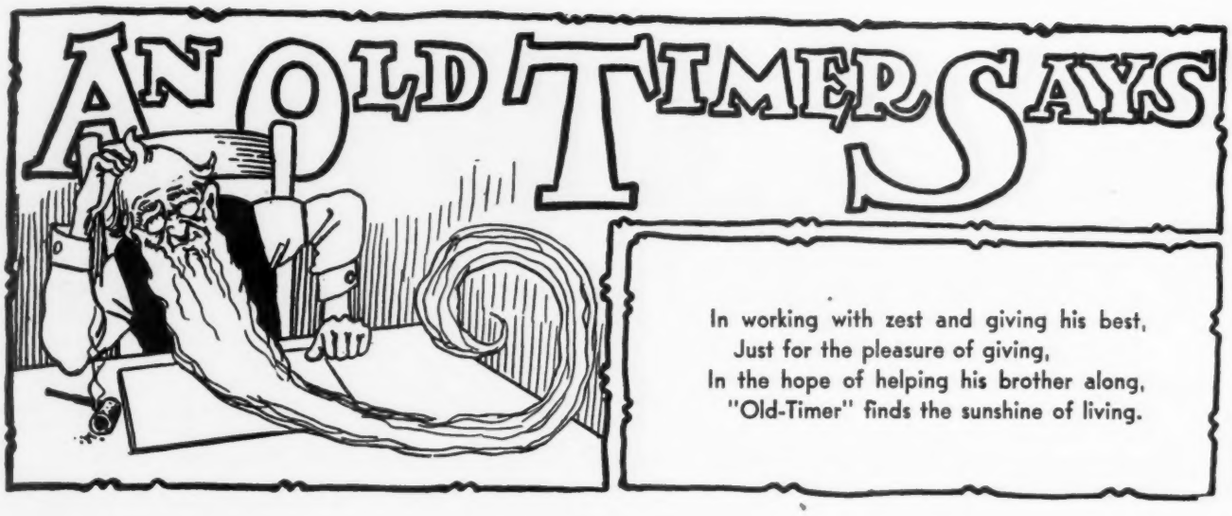
AN OLD TIMER SAYS
In working with zest and giving his best,
Just for the pleasure of giving,
In the hope of helping his brother along,
"Old-Timer" finds the sunshine of living.

The Story of Old Timer's Methods of Working and Management

Part Eight—Continued from October Issue

IN this, the eighth installment, Old-Timer and his friend Jim continue their discussion of the value of keeping records in the spinning room, covering especially the subjects of Bands and Tapes, Weights and Levers, Frame Lifting Rods and Head Gears, Clearers, Piecing Up on Filling, etc. In the ninth installment, to appear next month, they will take up other items in the spinning room, and discuss the application of a system of inspection and maintenance, in line with the whole thought of this series.

Readers are invited to request reprints of the seven preceding installments in this series, in case they do not have them; and are urged to keep their copies of the issues containing the articles in this series.—The Editor.

(Note: Since this series is written in conversational style, it should be borne in mind that those paragraphs in regular type represent OLD-TIMER's part of the conversation, and those in *italics* are JIM's part.)

(Continued from the October Issue)

The next item in my book, OLD-TIMER, *is*

Bands and Tape

2/22/24. Looked over old tapes which had worn out. Found tape from Blank has bad selvage.

Tape men are making good lap and the new thread is lasting better than any we have used. The sample tape received last month is too heavy.

5/27/24. Found five new tapes off on Douglas ———— that were practically new. He was not sewing his laps correctly.

9/5/24. Nothing to report.

Such an inspection may seem trivial to most overseers and superintendents, but, if space would permit me to show the full report over several years, you would see that every one of these items is valuable. Don't forget that the one most important thing is that the overseer has given this item his personal attention at the date stated, and that relieves you of that uneasy feeling that something could be wrong and you not know it. It will probably be interesting to take a look at the tape and band record that the overseer keeps in connection with this inspection:

Tapes used day, 26,129
Tapes used night, 19,234

45,363 Total tapes used
Hours run day, 2,579; spindles run, 59,136
Hours run night, 2,623; spindles run, 52,493
2,579 × 59,136 = 152,511,744 spindle hours
2,623 × 52,493 = 137,689,139 spindle hours

290,200,883 Total Spindle Hours..

$$\frac{290,200,883}{45,363} = 6,397.$$ A tape drives 4 spindles,

therefore $\frac{6397}{4} = 1,599$ spindle hours per tape.

As we usually speak of most any kind of supplies, like shuttles, check straps, tapes, bands, etc., as lasting so many weeks, months or years, we will now reduce the spindle hours per tape to weeks.

1,599 ÷ 55 hours per week = 29 weeks, the life of a tape on this record.

The consumption at your mill may be more or less, but the main point is, do you know? *These tapes are ½-inch, weighing 16 to the pound, and driving a spindle at practically 10,000 r.p.m. on 30s yarn.*

Of course if you wish to carry the information further you can easily determine from the above what your tapes cost per spindle or thousand spindles per year, and much other useful information that it is not necessary to take up space to show, since the above calculation explains very clearly how to arrive at the life of a tape, matters not whether your mill is not running full time or whether you run only part of

NEWS

a LOW TENSION Rubber Belt

Compensated
PAT. APPLIED FOR

Manhattan engineers — the originators of Condor Belts — announce a new advanced type of transmission belting — the Compensated Belt.

Due to its special, compensated features (patents applied for), the belt performs best at 50% *lower* tension — resulting in longer bearing life, smooth and trouble-free running, and double the overload capacity of standard rubber belt.

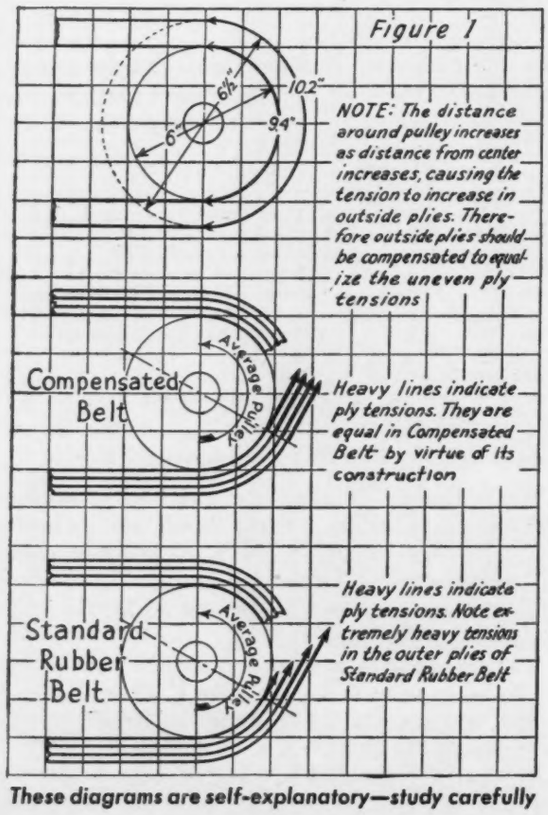
Figure 1
6½"
102"
94"
6"
NOTE: The distance around pulley increases as distance from center increases, causing the tension to increase in outside plies. Therefore outside plies should be compensated to equalize the uneven ply tensions
Compensated Belt
Average Pulley
Heavy lines indicate ply tensions. They are equal in Compensated Belt by virtue of its construction
Standard Rubber Belt
Average Pulley
Heavy lines indicate ply tensions. Note extremely heavy tensions in the outer plies of Standard Rubber Belt

These diagrams are self-explanatory—study carefully

We cannot urge you too strongly to investigate fully the Compensated Belt. We firmly believe industry will soon acclaim it, as many experts are now doing, as the greatest single advancement in rubber belt construction yet announced.

Your jobber can supply you

10 Advantages of Compensated Belts

1. Longer fastener life.
2. Higher efficiency when run slack.
3. Higher efficiency on small pulleys.
4. Freedom from ruptures in outside ply.
5. Freedom from wear on pulley side.
6. Freedom from ply separation.
7. Double the overload margin of safety.
8. Higher efficiency under all running conditions.
9. Reduced bearing, shafting, and hanger troubles.
10. Material reductions in belting "costs".

The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Executive Offices and Factories, Passaic, New Jersey

your frames at night, etc.

Keep your hours run per day and night; then keep the record of your spindles run day and night and you have information which is absolutely fair in comparing one year with another or one kind of supplies with another. The custom some men use of merely making a record of the date when a certain supply is put into use cannot give you much information unless you should happen to run the same number of hours each day, month and year and run the exact same number of spindles. This, I doubt, has ever happened in any mill two years in succession. Here is the record of bands used on 40s to 44s filling running at about 7,800 r.p.m. Bands weigh 86 to the pound.

3,486 lbs. bands used × 86 = 299,796 bands

2,602 hours day run ×
57,024 day spindles run = 148,376,448
2,644 hours night run ×
40,599 night spindles run = 107,343,756

255,720,204 Spindle hrs.

255,720,204 ÷ 299,796 = 852 hours per band.

852 ÷ 55 hours per week = 15.4 weeks.

The life of a band will vary much more than the life of a tape because it is affected more by sudden changes of weather. The knot is not as good a fastening as the sewed laps on a tape, etc., etc. When this record of inspection was first started the overseer soon found that the life of both tapes and bands depended almost wholly on the fastening; that is, tapes wore out at the lap and bands at the knot. He improved on the tape by carrying out extended experiments with the method of sewing the laps and finally finding a sewing thread that gave the most life.

We pass on to the next item—

Weights and Levers.

Say, now, Mr. Reader, if you want to realize the value of the system we are trying to explain, please answer this question to yourself. When have you looked over your weights and levers? Or are you just leaving that to the second hand and section men? Let me suggest that tomorrow you take just ten minutes—you can spare ten minutes, can't you, to prove to yourself whether this system is really any good or not?—and look over a few alleys of yours. See how many you find touching the board; see if some of them are not cut into the screw so much that if you take the weight off the end will not come down. Will a lever too low put more or less weight on the roll?

1/14/24—Looked over both rooms, 2 alleys to section.
3/5/24 —Looked over both rooms, 3 alleys to section.
5/21/24—Had sections No. 2 and No. 5 to go over levers with gauge—few were too slow. (We havea block of wood for each section man that he used as a gauge to slip under the lever).
9/3/24—Have notified all men on filling to put gauge on their levers and report to me when they get over so I can inspect them again.
9/24/24—Levers O. K.

Frame Lifting Rods and Head Gears.

3/25/24—No. 4 section in bad shape; looks like someone has put oil on rods.
5/13/24—No. 4 section had some frames run too full. Frame No. 64 gear making noise, showed section man how to set them.
One frame tangling. Section No. 1.
Cleaned all lifting rods in warp this week.

Clearers.

3/6/24—Put in 600 underclearers or scavenger rolls on No. 1 filling, No. 2 and No. 3 sections. More need taking out; roller shop behind; promised to cover some next week.
5/11/24—Looked over all clearers; found three spinners not cleaning the pins well enough.

Take the above item, for example. Underclearers or scavenger rolls do not give much trouble so long as the work runs well, because the spinner is making her rounds often enough to see one when it stops. But when she is having more ends to put up than usual, if her scavenger rolls are not in good shape they are going to cause her a lot of extra work. The overseer found underclearers where a small amount of waste was being left on the pin. A roller like that is more likely to choke up when the end next to the stand comes down, than is one with a clean pin. When the roller chokes, the spinner usually has about four times as much to do, when she gets there, than she would have to do if she only had to put up the one end which came down, instead of a choked roller which probably has now knocked down several other ends and maybe ruined a top roller.

Piecing Up on Filling.

4/23/24—Ray ——— lapping ends on section No. 1. Superintendent passed through and saw R. Jordan's wife piecing up where he was doffing her frames and asked me if we had put girls to piecing up behind doffers.
5/4/24—Did not see any one lapping ends or piecing up wrong. Talked to second hand and all section men and explained to them how bad piecing up would make thin places in the cloth.
5/14/24—Took all doffers down to cloth room and had them look at several cuts of cloth that had thin places and also took them to the weave room and had Mr. ———, the boss weaver, to show them how bad piecing up would often cause the filling to break on outside of shuttle, leaving a tail of filling which would knock up the filling fork several times before it would break off, thereby causing a thin place.

You see, OLD-TIMER, *we are still carrying out the idea you gave us years ago; that the operators are human beings, and although some of them don't give a darn, it is a proven fact that if you show them the effect their bad work has, a majority of them will have conscience enough to think of the defect in the cloth and will actually profit by it.*

We have found that if you will do more of this kind of educational work among the operatives, instead of so much cussing, you will not only get much less bad work, but a lot more co-operation from them in every way. Just the other day the overseer of carding came up the alley behind a boy sweeper and saw the boy push a speeder bobbin under the frame. He said to the sweeper: "Pick up that nickle, Tom," and walked on down the alley. The boy looked all around on the floor, then began to look through the pile of waste he was sweeping up, for that nickle. The overseer went back and explained to Tom that the bobbin he saw him kick under the frame cost five cents, and he must always pick up things which cost money the same as he would pick up money. Well, anyway, I will bet

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a hundred nickles that the boy will remember that lesson as long as he lives, and I will also bet that it will do him a lot of good in many things with which he comes in contact when he gets to be a man.

I saw this same overseer of carding have a cut of cloth in the card room last week showing it to his frame hands and section men, and was told that he was showing those operatives the defects in that cut of cloth caused by lumps of fiber getting on the roving from fanning off the frames and black threads in the cloth that were caused by black waste or oil getting onto the roving in the card room. He explained to them that some of the oily waste came out of the bobbins where fly had accumulated and would fall out on the roving as the roving bobbins were thrown onto the box while doffing the frame, and many other causes which all overseers and superintendents are more or less familiar with.

The point I wish to bring out is the method *used to educate the operative rather than a detailed description of causes. After showing the frame hands these things the overseer had no trouble in getting his frame hands to stack the roving in the doff boxes rather than throw the bobbin of full roving into the boxes. This greatly reduced the black places on the roving and in the cloth.*

Say, JIM, you know what makes so much of that oily fly inside of the bobbins, don't you?

Sure, OLD-TIMER, *you showed us that four years ago, and we have not oiled any bolsters since. We we're afraid to stop oiling bolsters on all the frames at once, so we selected four frames and ran them a year, in fact, 14 months, and then inspected the bolsters and spindles, and not only found no more wear on them than on the other frames, but the frames where we had not oiled the bolsters were much easier to pull. We noticed it first in stopping the frames. After the belt was pushed off the tight pulley the frames where the bolsters had not been oiled would run much longer and—*

That's enough, JIM. Get back in the spinning room now; we agreed that we had talked about the card room enough, so hurry along with that spinning stuff and let's get out of the spinning room before these fellows get tired.

(The ninth installment of this series, in which Old-Timer and Jim continue their discussion of records and inspection in the spinning room, will appear next month. If you wish clippings of previous installments, let us know.—The Editor.)

Colson Institutes Direct Sales.

The Colson Company, Elyria, Ohio, recently introduced a new policy of direct factory supervised sales, displacing the Colson-Stores Company, a separate corporation, which formerly acted as a sales outlet for the Colson line of casters, wheel chairs, etc., etc. The company announces that, operating in friendly receivership, it was adjudged solvent in the Federal Court of the Northern District of Ohio, and that the action in involuntary bankruptcy brought against it was dismissed at the expense of the petitioners, and that the company is continuing in business.

:: :: ::

"Liberalism in the South."

Under this title Virginius Dabney has written, and the University of North Carolina Press, Chapel Hill, N. C., has just published, a review of and comment upon liberal tendencies and trends in the South, from the time of the American Revolution up to the present. The book is divided into four parts—the era of Jefferson, 1776-1830; the era of Calhoun, 1830-1865; post-Civil War days, 1865-1900; and the New South, 1900-1932.

The author sets out to present "the progress achieved by liberal thought and action", through these eras. In the presentation of his theme he gives at the same time interesting records of general history throughout these periods. Opinions as to the ultimate worth of the book will differ according to the individual viewpoint as to liberalism, and what liberalism is; but, approaching his task with the viewpoint of a liberal, according to his own definition, and with the intent of championing the cause, Mr. Dabney has produced an interesting presentation, written in a style that is engaging, frank and vigorous.

The price of the book is $3.50 per copy.

:: :: ::

Todd's Report on World's Cotton Crop.

Discussing the world's cotton position in a statement made to the Association of Cotton Textile Merchants of New York Professor John A. Todd, the famous English economist, points out that "the outstanding feature of the last two years has been the renewed evidence of the unlimited capacity of the American cotton crop to falsify all predictions and do the exact opposite of what it did the year before.

"In 1930 the alarming feature of the American cotton situation was the extraordinary change-over of the world's consumption from American to outside growths as the result of three bad American crops in succession, both in quantity and quality, with the inevitable effect on relative values. Two years ago the figures showed for the first time that in one half-year the world had apparently consumed more outside growth than of American cotton. In 1930-31 the first half of the season carried this tendency still further, but the second half showed a distinct reaction in favor of American and in the season just closed this reaction has been carried still further. For the time being, at least, American cotton has reasserted its dominant position.

"During the past season the United States consumption of American cotton has steadily declined while that of the rest of the world has increased but exactly the contrary movement is shown in the comparison of the rest of the world's consumption with that of outside growth. The former has been increasing for three half-years while the latter has declined even more. The main cause of this seesaw movement of relative consumption lies in the vagaries of the American crop.

"For nearly two years after the Wall Street crash, the fall in the price of cotton was not due, as it was alleged to be in so many commodities, to any excess of supplies; on the contrary, the world's cotton production had been quite moderate and it was only the effect of restricted consumption that gradually began to pile up the world's stocks of cotton, which by the end of July, 1931, were rapidly approaching a record figure.

"The sentimental effect of the fall from last year's figure of 17,096,000 bales, i.e., from the second largest figure in history to one of the lowest in recent years, completely overshadowed the fact that the prospective season's supply, even with such a small crop, would still be the second largest in history. The change in sentiment had its effect on the actual demand for cotton goods with August sales showing a record figure."

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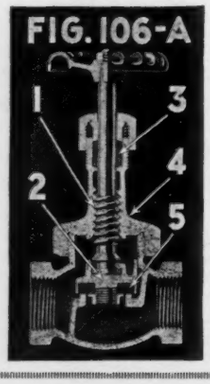

Fig. 106-A Jenkins Standard Bronze Globe Valve has:—

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HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all Varieties of Mill Subjects

Another Comment on Roll Leather Splitting.

EDITOR COTTON:

I have just finished reading the articles on the subject of "Causes of Roll Leather Splitting", page 62 of August COTTON and 106 of October COTTON. Knowing something about this subject myself, I cannot resist your invitation to enter into the discussion.

These letters, as you know, resulted from a question asked at a meeting in Atlanta, reported in your April issue, "What causes the outside or hair side of sheepskin rolls to come loose from the meat side, sometimes after running a short time?"

First of all, these writers, "E. D." in August and "CONTRIBUTOR NO. 6150" in October, referred to the roll covering as sheepskin. They are almost right in this respect, but practically 100 per cent of the sheepskin sold for roll covering is really lambskin. It has to be. Sheepskin is altogether too rough and coarse. A sheepskin will measure anywhere between 9 square feet to 13 square feet trimmed, while lambskin will very rarely go over 8 square feet and usually average between 6 and 7 square feet. I mention this as it is quite important in discussing splitting.

Sheepskins and lambskins are always quoted separately as to price, as there is quite a difference in their relative sizes and textures.

Coming back to the subject, splitting may be caused either by improper treatment of the raw pelt or it may be brought about by causes that affect the living lamb. This latter is typical of New Zealand skins. In American domestic skins, there is very little natural splitting, and thanks to improved methods in the beamhouse operations (unhairing, etc.) we are finding less loose grain, the cause of this separation.

In New Zealand there seems to be a big rush to get the new spring lamb out onto the market. This includes the meat and all of the by-products. Due to this haste, we have in their skins what is known as "milky lambs". Meaning that lambs are slaughtered before they are thoroughly weaned. They have had very little opportunity to get out and eat grass, etc. As a consequence, the gelatinous substances in the skins of these lambs has not had a chance to set. It is still jelly-like, and when the pelts go through the beamhouse operations, most of these gelatinous substances simply flow away, leaving nothing but a hollow shell. In addition to this natural fault causing splitting in New Zealand skins, there is also present the man-made causes brought about in the beamhouse, found to a much less degree in domestic skins.

Splitting in American domestic is caused mostly by lax treatment in the unhairing operations. The pelts are allowed to stay too long without checking in the various baths, in which the development of bacteria and chemical compounds such as amines eat away or dissolve out the collagen or corium. This dissolved substance is, subsequently, washed away leaving nothing but voids. In carefully beamed skins, care is taken in each process to see that the pelts do not remain in the various baths longer than it is necessary to complete each operation. When such skins as these are tanned in real bark liquors, this corium is fixed by tanning and the result is good solid leather that will never split.

I heartily agree with the final two paragraphs in the letter of "CONTRIBUTOR NO. 6150" in the October issue. To me it is deplorable that the men in charge of cotton spinning should know so little about what good roller leather should be. Price seems to be the only thing that concerns them.

There are on the market today the worst examples of what roller leather should not be that were ever perpetrated on the unsuspecting textile trade. The manufacturers of these skins have brought the prices down so low that it is impossible for real roller leather to compete. These skins that I am speaking of are the cheapest New Zealand skins, not even bark tanned, and are finished without the slightest idea of what a roller skin should or should not be. It is in this type of skin that the mills are finding splitting and other faults. The cry is then that no sheepskins are any good and off they go on something else. If a mill would buy a good grade of leather that can be proven to be genuinely bark-tanned and finished by experts, they would be satisfied; in addition, much economy lies in treating the rolls after burning down, and before calendering, with a good flexible top dressing.

In England the mills have for years adopted the practice of taking what appears to be perfectly good rolls out of the frames and re-calendering and re-dressing them. They claim that this gives them bet-

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WE invite our readers to make use of this department for the discussion of any and all problems arising in the mill or finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statement of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

◆ ◆

ter results and saves them money, and if figures count for anything, their claims are true.

CONTRIBUTOR NO. 6168.

Disagrees With "Young Timer" About Clutch Spindle.

Says spindle of proper size with proper acorn and bobbin with brass bushing is better than the clutch type.

EDITOR COTTON:

I notice on page 59 of your November issue that "YOUNG TIMER" tells of an experience in which he said that a mill made an improvement both in increased production and the running of the work, by substituting clutch spindles for spindles equipped with acorns. I will quote in part what he says, "I want to tell you how a certain mill I know of was able to increase their production and also lower the spinning cost at a very low expense to the mill * * * The management bought some spindles, which were a trifle larger and heavier than the spindles they were using on filling spinning frames * * * These spindles were sent to a machinery manufacturer and a clutch put on for about 40 cents each. Then the mill put these spindles in the frames in the place of the old spindles which did not have the clutch. This allowed them to speed up the front roll about 12 per cent. * * * Of course this made a nice reduction in spinning cost. * * * The reason they were able to speed up was because with a clutch spindle they could run the spindle at a faster speed and the bobbin would not jump up as it would on a spindle without the clutch; and, as you know, when the bobbins jump up on a spindle it causes bad work which the weave room will not have."

I have quoted this much of "YOUNG TIMER'S" letter, because it will be seen that he gives the clutch credit for the improvement shown, whereas it is my impression that the fact that a larger size spindle was used had a great deal more to do with securing this improvement.

If the original spindle had been of the proper weight and size for the package to be made, and equipped with an acorn of the proper taper, with the spinning bobbins in fair shape, the mill would have experienced very little of this trouble of the bobbins rising on the spindle.

While there has been much improvement in recent years in the manufacture of clutches for spindles, and while a mill would not go wrong in purchasing clutch spindles from any of the reputable manufacturers, I think you will find that it is generally agreed among practical spinners that the trouble which a clutch causes more than offsets any advantage received from it.

If the spindle is not of the proper weight and size for the package, the clutch will not hold the bobbin down any better than the acorn will. The clutch will not grip the bobbin as tightly at the base as a good acorn will. This is illustrated by the fact that the manufacturers of large package spinning prefer to specify clutch spindles on 3-inch ring spinning, to make it easier for the operative to stop the bobbin for piecing up an end. A bobbin when gripped by the operative will slip more freely on the spindle than it would with a good acorn. Spindles with brakes would solve the problem but the brakes would only make more cleaning necessary.

It is my belief that a spinning spindle with an acorn of the proper taper, used with a bobbin fitted with a brass bushing, will give a better fit, and at all times grip the spindles more securely, than will spindles equipped with clutches.

CONTRIBUTOR NO. 6177.

A Difference of Opinion on Weaving Sateens and the Terminology Involved.

EDITOR COTTON:

The discussion on "Points on Weaving Sateens," by CONTRIBUTOR NO. 6145" on page 95 of October COTTON is very interesting. The rule given by him for constructing a sateen weave is the one generally used, and can be used on both the 5 and 8 harness and other sateens, but not on the 4 and 6 harness. The threads in a 4 harness sateen are usually raised or lowered 1—2—4—3, and this sateen is often called a "broken" twill because two threads run to the right and two to the left.

I would not, however, class a 6 harness sateen as a broken twill, as he has done, understanding the word twill to mean a line running diagonally in the fabric. A real sateen weave does not have any two threads working together as in a twill. This is seen by the raising or lowering of the threads in a 5 or 8 harness sateen weave. In the 5 harness sateen the threads operate 1—3—5—2—4, or 1—4—2—5—3; and in the 8 harness sateen as 1-4-7-2-5-8-3-6, or 1-6-3-8-5-2-7-4.

Another method of applying the rule to find the raising or lowering points in a sateen weave is as follows: Write the number of threads in the sateen to be made, then draw a line under these numbers. When this is done, select the counter to be used, then under the line mark the thread as it has to be raised or lowered, beginning with the first thread and crossing off the number as each is indicated under the line. With a 5 harness sateen, use 2 as the counter. The result will be:

$$\frac{1\text{-}2\text{-}3\text{-}4\text{-}5}{1\text{-}3\text{-}5\text{-}2\text{-}4}$$

With the 8 harness sateen the result will be as follows, using 3 as the counter:

$$\frac{1\text{-}2\text{-}3\text{-}4\text{-}5\text{-}6\text{-}7\text{-}8}{1\text{-}4\text{-}7\text{-}2\text{-}5\text{-}8\text{-}3\text{-}6}$$

Following out the idea that no two threads in a sateen should be raised to follow each other on consecutive picks, the threads in a 6 harness sateen would operate as follows: 1—3—5—2—6—4, or 1—4—2—6—3—5, or 1—4—6—2—5—3. By changing the movement of the threads the twill line is not con-

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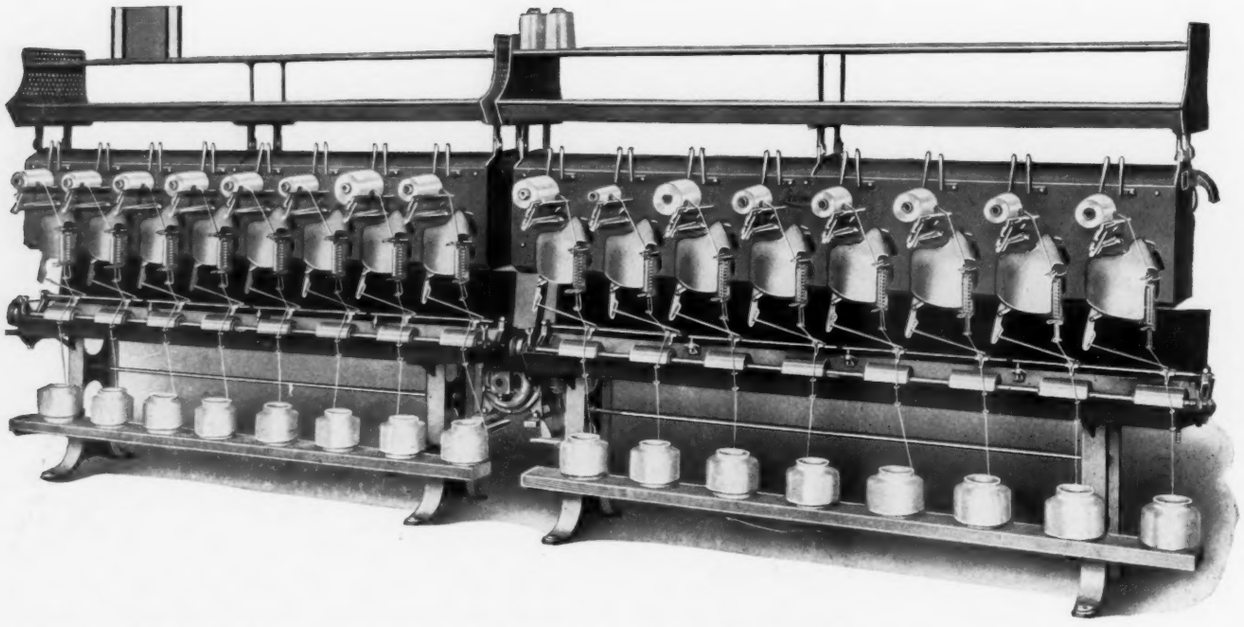

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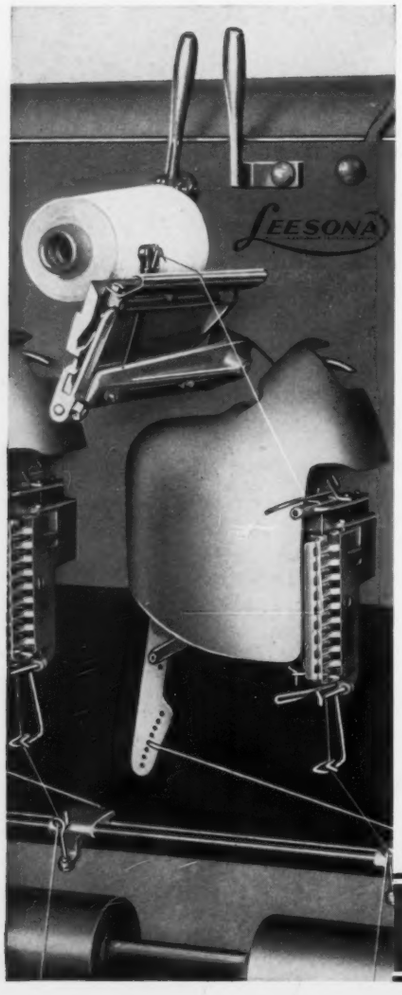

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tinuous.

The sateen weave is often used in fabrics to make checks, as in handkerchiefs. The stripe in the fabric is of warp sateen with the cross bar or check a filling sateen. The cross bar should be made very near the same density as the warp stripe. In making the bar there are a few points which must be taken into consideration. First, if a 4 harness sateen weave is used for the warp stripe then four harness shafts will be required for the plain fabric so as to make a 4 harness sateen or broken twill in the cross bar, but if a 6 harness sateen weave is being used for the sateen stripe, then 6 harness shafts will be required for the plain so as to make the cross bar as near equal to the warp stripe as possible.

Second, when making a cross bar in the fabric a large number of picks must be forced into a limited space, which brings up two other points for consideration, namely: (a) the take-up motion must be stopped on certain picks so as to put in the cross bar the extra picks required; and (b) the sateen weave in the warp stripe must be changed so as to allow the extra picks to be beaten up into the cloth as a regular sateen will not permit this to be done.

For illustration, suppose a check fabric has to be made with 1 inch plain and ¼-inch warp stripe. The base of the fabric to be 64x64. The number of threads in a pattern will be as follows:

1 inch plain, 32 dents, equals 64 threads
¼ inch sateen, 8 dents, equals 32 threads (4 harness sateen)

To make the check the picks will be put in the fabric as they are in the warp. As there are only 16 picks in ¼ inch and 32 picks are required for the cross bar or check, the take-up gears will have to be stopped for 16 picks. This is done by connecting the check pawl—not the driving pawl—to a harness lever in the dobby and raising the harness lever the required number of picks. The stoppage of the take-up gears must also be distributed evenly throughout the check so as not to have any heavy places in the check.

Sometimes in making these cross-checks a smaller number of picks are inserted than there are in the warp sateen stripe.

CONTRIBUTOR NO. 6166.

EDITOR COTTON:

I have noted with interest the advance copy which you sent me of "CONTRIBUTOR No. 6166's" comments on my article, "Points on Weaving Sateens", that appeared in the October issue of COTTON. I do not think there is anything further I can say, except that this contributor just repeats my article in the lifts he gives; and though he says use certain numbers for counters he does not say where or how he gets them, and that is very essential.

The first paragraph of my article stated that what I wrote was the opinion of just one man and that others would get good results from perhaps a different method.

Calling a six harness sateen a broken twill does not of course make it a trade name. But in his lifts, "CONTRIBUTOR No. 6166" shows that a six is not a true sateen. As a twill (six harness) is lifted 1-2-3-4-5-6 and seven other ways (and all of these can be reversed) but all lifts giving twill effect, now if "CONTRIBUTOR No. 6166" shows his lift is not a true sateen, and the lifts I give are six harness twills, what is the lift he gives? Will you allow me to quote an authority?

"The principles for the construction of satins are to arrange as much as possible distributed stitching, and to have it done at the same time, as regular as possible. The more scattered we can arrange the interlacing of the warp and filling the less these points of intersection will be visible in the fabric. The lowest satin that can be produced is found in the five-harness satin; after this the same can be made 'regular' on any number of harness, *with the exception of six.*

"The four-leaf broken twill *is also sometimes* classified as a 'satin' but against the rules of construction for these weaves, as on two successive picks the interwoven threads are next to each other."

The authority quoted is E. A. Posselt, in his "Technology of Textile Design". Sometimes, as with "CONTRIBUTOR No. 6166", one is compelled to use six harness and the lift is, as he quotes, 1 — 3 — 5 — 2 — 6 — 4. My article was supposed to be on regular sateens, but I should no doubt have gone further into the matter of the six harness.

CONTRIBUTOR NO. 6145.

More on Preventing Neps.

EDITOR COTTON:

In the March issue "CONTRIBUTOR No. 6046" wants to know what causes neps in cotton, and wants help in eliminating them. I imagine he is more interested in how to get rid of them than in what causes them. Mother Nature and the gins are the main causes of neps in cotton. Gin-damaged cotton is perhaps his greatest trouble. Mills buying cotton in small lots from cotton brokers on samples submitted to the mill are sure to get a lot of gin-damaged cotton, especially where the cotton is bought on grade and staple alone. The broker has hand-picked his cotton as regards grade and staple, and when it is bought on this basis, that is about all that is received. In many cases the spinning quality of the cotton is very poor due to bad or improper ginning. When a mill gets this kind of cotton it is almost impossible to make a good grade of goods from it. Mills should be very careful in buying and selecting their cotton.

Taking it for granted that his cotton is good, I will suggest the following toward helping this man's condition. He should go over his vertical opener; the beater should not run over 600 r.p.m. Sometimes this machine will curl or roll the cotton due to a high-speeded beater, not enough pull of the air, etc. Check the air draft in the pickers. Go over the Kirschner beater and see that the pins are in good shape; set the beater 3/16-inch from the feed roll, and run the beater about 1,000 r.p.m.

I would suggest the following changes in his card settings as given: Change the mote knives from a

Diagnosing the trouble- and correcting it

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Such a condition is a case for immediate diagnosis, calling for the service of a well trained specialist. Over 300 concerns have found that the Bedaux Principle of Labor Measurement finds the weak spots and restores plants to healthy operating bases—for only a very small expenditure that is quickly absorbed.

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12/1000 to a 10/1000; change the stripping plate from 34/1000 to 29/1000. Change the back plate from 22/1000 to as near 34/1000 as possible. Change the licker-in from 7/1000 to 10/1000. Change the flat setting from 7/1000 to 10/1000. Otherwise I think his settings are all right. I would change the cylinder speed from 160 r.p.m. to 165 r.p.m.

In my opinion, 7/1000 is too close to set the flats, especially where they have been in use over a long period of time. There will be soft and irregular wire that will not stand up to its original position, high and low flats and many other defects due to continual use of the drum grinder and flats wearing irregularly on the ends. Card flats with these defects, when set too close, are certain to produce poor stock and sometimes the cotton will look like it is rolled. I would also keep the cards well ground and the flats sharp; and not depend too much on the other fellow, but go over a few of the cards to see that they have the proper setting.

CONTRIBUTOR No. 6083.

Card Settings for Coarse Yarns.

EDITOR COTTON:

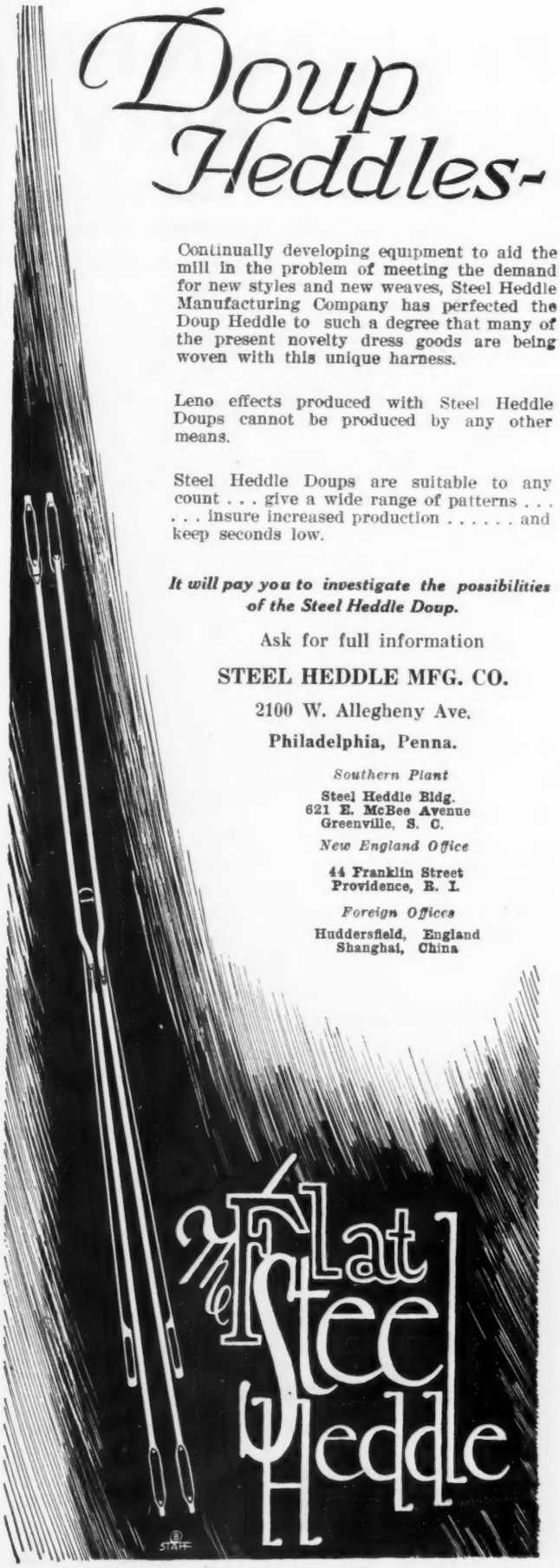
On page 63 of the July issue of COTTON you published a letter from "CONTRIBUTOR No. 5040" in which he discussed card settings on 20s carded yarn made from 7/8-inch Middling cotton, with first consideration being given to breaking strength and second to cleanliness. He listed the settings of another contributor in one column, and gave his own settings in another.

I am wondering if there is after all any difference in the breaking strength of the yarn made by these men with the slight differences in card settings indicated. I believe the difference would be negligible. We are all aware of the fact that there are numerous other factors than cards that are responsible for variation in yarn number, so I will limit this discussion to card settings only.

First in consideration is the setting of the feed plate, which should be set according to the weight per yard of the lap. A good rule for this setting is a 10/1000 for a 10-ounce lap, going up 1/1000 for every ounce added to the lap weight.

When setting the mote knives the grade of cotton should be taken into consideration. If the stock is dirty and not uniform, the mote knives should be set as close as possible, and when the stock is clean and uniform, for 7/8-inch cotton, the mote knives should be set to a 12/1000 at top and a 17/1000 at the bottom. I have advocated such a setting in previous contributions in "HOW OTHER MEN MANAGE", and I have never had a comment on either of them. I wonder if any readers have tried this setting, for breaking strength; if they haven't, it might be interesting if they would take into consideration also the setting of the licker-in screen nose, which should be set according to the condition of the stock. When the stock is very dirty, the nose should be set to 3/16-inch, and when the stock is both clean and uniform, the nose should be set as close as possible. Why not take the short fibers out at the card; if we don't, they will fly out at each succeeding process and accumulate around the trumpets and cause slubs?

T. R. (N. C.)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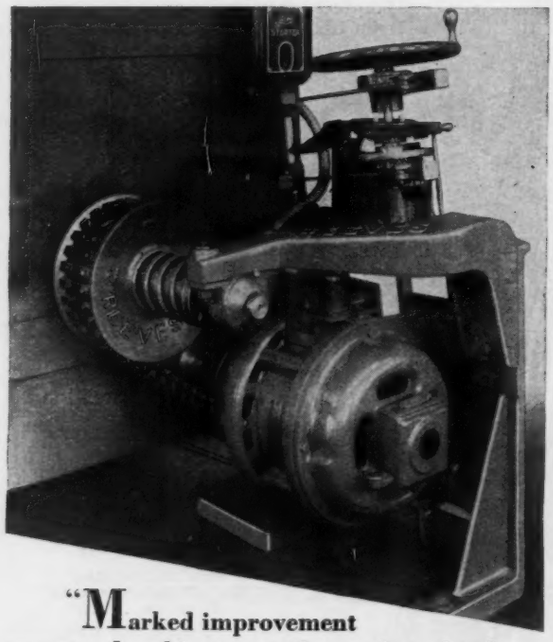

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"R. G." Still Disagrees with "M. W. H." About Comber Settings, Etc.

We urge other comber men to join this discussion, and will furnish clippings of the previous arguments upon request. Somebody page "Contributor No. 5070" for us. He started all this, and we want to hear from him!

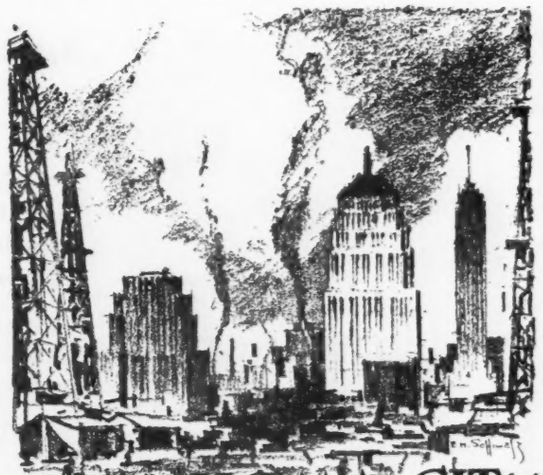
EDITOR COTTON:

Both "M. W. H." and I have repeatedly invited the comber men to join us on this subject of setting combers, but so far, not very much has been accomplished in that direction, with one exception, the article by "A. T. (GA.)" on page 55 of the September 1932 issue, which I think is very good. I cannot understand why others do not join us, because, as "M. W. H." says, "There are many comber experts, and it has always been my observation that they have varying views regarding combing". The only explanation that I can give is, that they are not interested enough, or, that they had rather sit back and take it all in. Be that as it may, I wish to submit these further thoughts on the subject:

It is quite true that the ideas of various comber men will differ, however, there is only one correct setting of a comber to get the best results for a certain grade and staple of cotton, taking out a given percentage of waste, and this correct setting cannot be obtained the first time. The point is, to get a setting that will give the required percentage of waste without getting long fiber into the waste box.

This mistake can be made in two ways; for instance, if the feed roll and cushion plates are set too wide or too far away from the detaching roll, long fiber in the waste box and poor combing will be the result. On the other hand, if the feed roll and cushion plate are set too close to the detaching roll, the fibers will be strained; the cotton will be plucked out in bunches, making a straggly separation between the feed roll and the detaching roll and then the half lap will get these protruding fibers and they will be carried to the waste box. Therefore, by setting the feed roll and the cushion plate too close to the detaching roll, the result will be long fiber in the waste box, bad running combers—which means a loss in production and an excessive amount of waste to be run over again—and last, but not least, the yarn will have a poor breaking strength. So, it will be found, in setting a comber, we must reach the happy medium in order to get the best results.

In the article submitted by "M. W. H. (MASS.)", which appears on page 110 of the October issue of COTTON under the heading: "M. W. H. Wants More of You to Join the Combing Discussion", he says: "R. G. has agreed with me on all of the important statements", and in answer to that, I want to say that if the reader will look back to the July 1932 issue, page 65, he will find that I have not agreed with "M. W. H." on any point, nor do I intend to do so untill he changes his ideas on combing. I do not know why he should make such a statement unless he is trying to pick up the marbles and crawl out of the game. I did criticize his method of lining up his cushion plates by filing the nipper slides, and I explained fully where I thought he was wrong, but he



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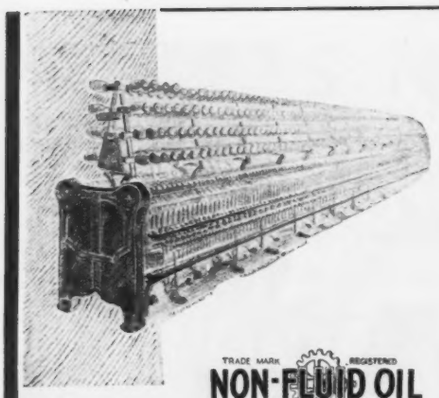

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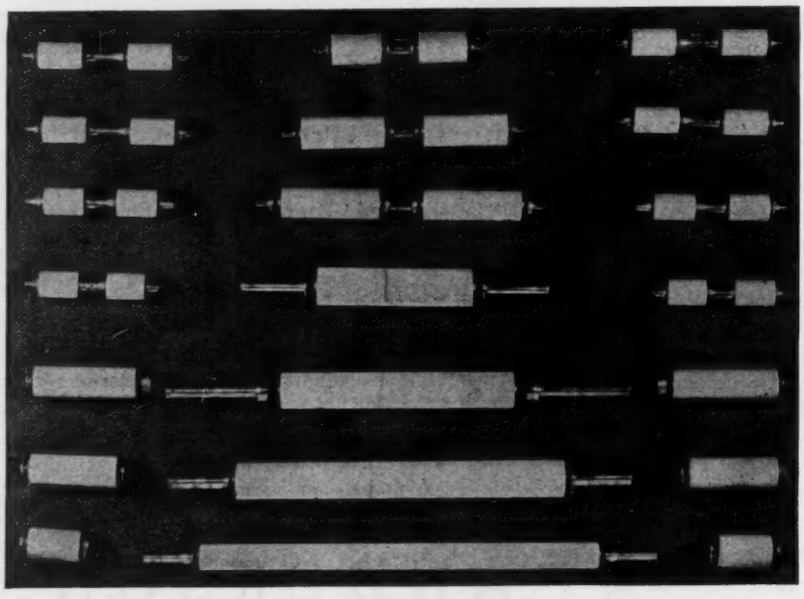

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did not mention this point in his article.

There is a particular point on which I should like to have the ideas of the comber men. In the fifth paragraph of the article by "M. W. H." in the October issue of the magazine he says: " 'R. G.' says the steel detaching roll should be the heart of all settings". He also says, "All you can do with the steel detaching roll, that I know of, is to set it in the bearings—being sure these bearings are in line—and that the roll turns freely when the caps are on."

I want to say right here, as I have said before, that the steel detaching roll *has* a setting; otherwise, there would be no method of knowing whether the roll was in line or not.

I did not say that the detaching roll should be the heart of all settings, but that it *is* the heart of all settings, and this is the reason: The setting on the detaching roll is the first setting that is made after the cylinder shaft is put in and the comber leveled up. The detaching roll is set to the high part of the segment to a 21s gauge, and so that it will turn freely when all the caps are screwed up tight. By setting to a 21s gauge we know that the roll is in line. Therefore, all other settings will be correct, but if the detaching roll is out of line, all other settings will be out of line accordingly, because all other settings are made from the steel detaching roll, and, therefore, it *is* the heart of all settings.

In the sixth and eighth paragraphs of his October article "M. W. H." claims that it is the movable cushion plate that causes the Heillman type comber to make a better piecing. I disagree with him on that point also, as it is my honest opinion that it is the segment on the Heillman type comber that is most responsible for the better piecing in that comber. as this segment is 3 inches wide, while the segment on the D-2 Whitin is only 2⅞ inches wide. Also the detaching cam in the Heillman type comber is of a little different shape, so, along with the wide segment and the different shaped cam, a longer overlap is made; therefore, a longer and better piecing is made.

The idea of the swinging nipper frame or movable cushion plate in the Heillman comber is to increase the angle on the nipper knife at the period when the half lap needles are combing through the fringe of cotton held by the nippers; also to bring the bite of the nipper back beyond the center of the half lap which is claimed to be the best combing position and I, myself, believe that this is true.

In his last paragraph, "M. W. H." comments on the cushion plates of the Heillman and the Whitin D-2 types of comber. This is quite an interesting point, and I should like to give my ideas on it.

I believe that the old cushion plate and nipper knife, such as were used in the Heillman and the Model C Whitin types of combers had a better grip on the cotton than those used on the D-2 Whitin, but they were not rigid enough, and were easily bent or sprung out of shape, which destroyed the bite, and also the bite was a little distance from the points of the cylinder needles.

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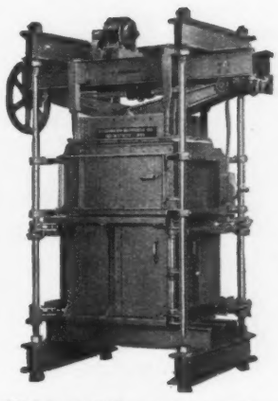

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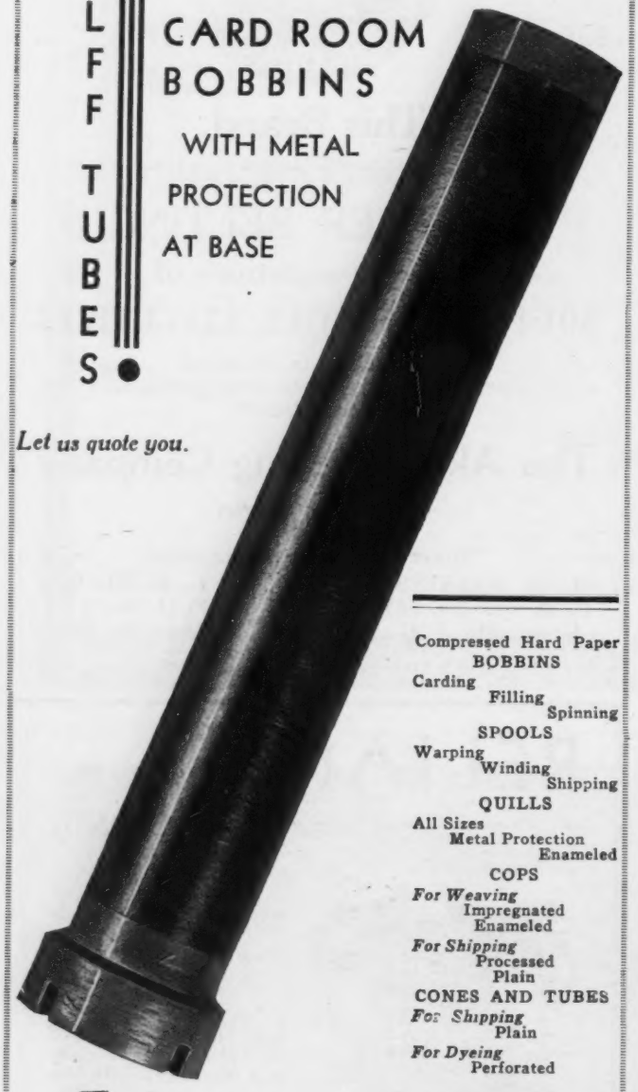

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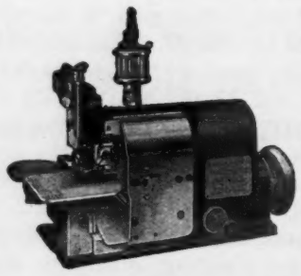

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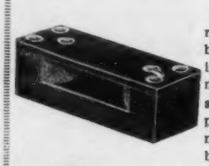

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designed so that the bite is very close to the points of the cylinder needles, which I think is a very good point, but I do not think that these nippers have as strong a grip on the cotton as the Heillman type nippers, but this is offset in the design of the D-2 comber and the way in which the feed roll and nippers should be set, and the smaller diameter feed roll which is 5/8-inch, while on the Heillman it is 3/4-inch.

In setting the nippers and feed roll on the D-2 Whitin comber, it will be found that the cushion plate is set wider and the feed roll closer than in the Heillman comber. For instance, if we were setting the D-2 Whitin comber for, we will say, 1 1/4-inch stock, the setting on the cushion plate would be about 1 1/2-inch from the detaching roll, and the feed roll would be set 1/8-inch or 1/4-inch further back than the cushion plate or 1 5/8-inch or 1 3/4-inch from the detaching roll. This setting would bring the bite of the feed roll close to the bite of the nippers; roughly speaking, the distance would be about 13/16-inch from bite to bite. So it will be seen from this explanation that as the cylinder needles are passing through the tuft of cotton, the nippers are closed and that most all fibers are being held by both the nippers and the feed rolls; therefore, there is less chance for long fibers to be plucked out and thrown into the waste box.

Now going back to the Heillman type of comber, the setting of the nippers and the feed roll on this would be quite different. In this case, we would set the cushion plate about 1 3/8-inch from the detaching roll, and the feed roll would be set at about 1 7/8-inch or 1 15/16-inch from the detaching roll. This would cause the distance between the bite of the nippers and the feed rolls to be about 1 1/4-inch or 1 5/8-inch, so it will be seen that at no time are the fibers held by both the nippers and the feed roll, so if the nippers on the Heillman type comber did not have a good grip on the cotton, there would be considerable long fiber thrown into the waste box.

In his last paragraph in October "M. W. H." says, "I think it was 'CONTRIBUTOR NO. 5070' that asked for a remedy for this setting", meaning the trouble that "CONTRIBUTOR NO. 5070" was having with his top combs on the D-2 Whitin comber striking the nipper knives. He says, "I have given mine. 'R. G.' seems to think it doesn't matter anyway, because the quality is good enough". My answer to that is that I wish "M. W. H." would try to get things straight if he intends to stay in this discussion. He ought to take into consideration that these discussions are being followed up pretty closely by most of the readers of COTTON, and they depend on this magazine for what information they can get out of it, and most of the readers keep their back numbers for reference. I know I keep mine, and I check up pretty closely on the statements made by "M. W. H.", which do not ring true.

"M. W. H." says that he has given his remedy; well, if he has, it has never been published. I have re-read his article in the October 1931 issue of COTTON, answering "CONTRIBUTOR NO. 5070", but I fail to find anything that would be of any help to the inquirer. But if the readers will refer to the December 1931 issue they will find where I gave my ideas on this trouble, and I am going to repeat some of this statement herewith:

"This man does not say how much angle he is putting in his top combs. On the D-2 comber, the standard setting for the top comb shaft is 6 1/2 inches from the back side of the detaching roll." In another part I said, "If a man tried to get too much angle in his combs he would run into the trouble which 'CONTRIBUTOR NO. 5070' mentioned; that is, the top comb striking the nipper knife," and if all nippers are properly set and all top combs set as close to the leather detaching roll as possible without touching, and all with the same degree of angle, there would be no trouble. If all nippers and combs are set as I have just pointed out, there will be no difficulty. "M. W. H." says "Move the shaft forward just as 'CONTRIBUTOR NO. 5070' did. What difference does it make?"

I should like to make an urgent appeal to "CONTRIBUTOR NO. 5070" to step out and get into this discussion. Surely he has derived some information from it and ought to be willing to step in and give us some of his ideas. I also appeal to every other comber man who is a reader of COTTON; they have nothing to lose, but a great deal to gain, and there is not one of us that knows it all.

R. G. (R. I.)

More Advice for the Second Hand.

EDITOR COTTON:

In the June issue of COTTON "C. F. (ALA.)" has an article on "Some Advice for the Second Hand." I think it is a very good article and would like to add just a few more lines to it.

I can remember, when I first entered the mill to work, the man who was second hand in the spinning room used to come down in the alley, and if the frames were not clean, how he would swear, and even go so far as to kick us kids who were cleaners. Times have changed somewhat and I don't think you find anything like that today. I think that systems and new ideas have been adopted in the various departments of the mill that keeps the second hand in closer touch with the overseer, and whereas in the past, you would find a second hand fixing a frame or doing some job that the third hand or section man should be doing, today you will find the real up-and-coming second hand supervising the fixing and not under the frame. Of course there are times when he will have to dig in and help to get things going, but I mean he doesn't make a practice of it.

The man who is the second hand in any room and has any ambition to get ahead should always be on the alert to learn something new. A good plan is to mingle with men who are overseers or men at other mills and get their ideas. I think that all second hands should read all the textile magazines possible and above all others, COTTON. As "C. F." said, a second hand should set an example for the rest of the help and never ask an operative to do anything that he, himself, wouldn't want to do. He should co-operate

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with the overseer and get all the pointers he can from him but not in a way to make him think he is trying to get his job. There are a few overseers who are afraid to tell their second hands anything for fear that they may work them out of their jobs. You can tell by the attitude a man takes as to how to get the most information in the best way. Remember, the second hands of today are the overseers of tomorrow. I wish to say, as our good friend OLD-TIMER says, a good plan is to ask: "Would I Hire Myself for My Job?"

CONTRIBUTOR No. 6136.

A Long Draft Spinning Installation

PART V—"LEARNING THE MILL GAME".

Information on humidity for long draft; using cork rolls on long draft; device for tying on spinning bands; also, some questions about these things which we hope you will answer.

EDITOR COTTON:

I enjoyed seeing you at the textile show. Wasn't it an interesting surprise to find so many exhibitors and to see such an enormous crowd of mill men in attendance every day? Although there were not as many exhibitors as usual, I contend that the 1932 show was one of the most successful ever held. The people took more time with the fewer exhibits and showed more interest. I heard quite a number of exhibitors say they got more prospects during the 1932 show than they had for a number of years. I think the textile exposition management is to be congratulated.

Warp Spinning Lay-Out.

Now to get back to some more of my experiences. In my article in the September issue I said I would give a lay-out of my job, so here is part of it: 64,000 spindles, tape drive, making 30s warp, from 1-inch Middling local cotton, front roll speed 117 r.p.m., spindle speed, 9,500 r.p.m., 8-inch cylinder making 1,166 r.p.m., 2¾-inch gauge, 1¾-inch No. 2 flange ring, twist constant 777.66, draft constant 384, average sides per spinner 18, also using "clean-up" hands, size of bobbin 8x¾ inches, combination wind, doffers on 18 frames, and section men on 66 frames.

Since my article in September COTTON (page 66) we have changed over our frames to long draft. We now have a front roll speed of 121 r.p.m., and spindle speed of 9,700 r.p.m., making 30s yarn, and our breaking strength has increased at least five pounds. Our new draft constant is 498.2, which, with a 29 draft gear, gives us a draft of 17.2, instead of the draft of 11.63 which we had on our regular draft with the constant of 384 and a 33 draft gear. On our warp our twist multiple is 4.75.

Filling Spinning Lay-Out.

We have 62,000 spindles on filling, 40s. The front roll speed is 108 r.p.m., draft constant 470.4, with a 32 draft gear, giving a draft of 14.7. The twist constant is 783.36, and we are running a 31 twist gear. Our filling twist multiple is 3.50. The filling rings are 1⅝-inch, No. 1 flange, spindle speed, 8,200 r.p.m.

Less Humidity for Long Draft.

For the first few weeks after we had our long draft installation finished we did not believe we were going to like it very well because it did not run as well as we thought it should. We kept on experimenting with it, though, and finally decided we did not need as much humidity with the long draft as we had used on the regular spinning. As a result of our experimenting with the humidity we found if we would keep our wet and dry bulb readings from ten to twelve degrees apart our work ran better and the ends did not lap up as badly.

Another important factor is oiling top rolls. This should be given careful attention; in fact more attention on the long draft than on the regular, for two reasons. As most everyone who has long draft knows, the weight for the top rolls is much heavier than on the regular, and if the rolls are not kept properly oiled and run dry it will absolutely ruin them. On the other hand, if too much oil is put on it will make the ends lap up and cause the rolls to choke.

We find that the long draft is much harder to keep clean, and it is very essential to keep the rolls picked extra well, because with such a heavy weight on the rolls, if they are not picked well, they will have a tendency to choke up quicker because there is more loose fly to gather or collect on the rolls. The biggest trouble we are having at the present with the long draft is that when most of our ends break they seem to lap up on the top roll and we have quite a number of rolls ruined by choking up.

While I am on the subject of top rolls and long draft, I want to give an experience on top rolls. The weight on the top rolls being heavier than on long draft, isn't it reasonable to assume, that with a sheepskin roll, the cost will be more than it was before putting on the long draft?

We believe this and we have decided to try some cork rolls. We would have tried them sooner, but we had tried them before on our regular spinning and could not get very satisfactory results, for reasons that we could not understand at the time. Now, within recent months, we have learned why we did not get satisfactory results with the cork and so are now ready to give them a fair trial.

Our trouble seemed to be that neither we nor the cork people used our heads very much in the previous case. We let them take our rolls to cover them, which they did, but they did not put enough cork on them to give us a cushion effect. In other words, we had them put the cork on our regular size rolls without having the rolls turned down. And so in order not to get the over-all diameter of our rolls too large after putting on the cork, the cork people could not put on enough to give a cushion effect.

The result was that after standing over the weekends our rolls would flute and have a tendency to cut our ends down. In fact, the rolls ran so badly that we could not get any of our men to run them. Since then we have learned how valuable it is to have as much cushion as possible, so we are going to have

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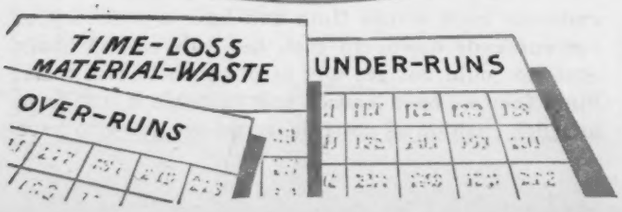

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our rolls cut down small enough so as to allow us to have the cork put on thick enough to have a good cushion. Then, after we do this we feel like our roller cost will be lowered and our work will run better.

Device for Tying Spinning Bands.

Recently we have entered into something that I believe will be a very big help. We have equipped our filling spinning with a device for tying on bands. Here is what we expect to do with these devices. Everyone, I believe, will agree that if we could get all our bands tied on to give the same tension all of the time as we get on the tape drives, we could save money. Now, by the use of this device, we are having all our bands tied on with 25 pounds pressure, and we know we are going to save bands by so doing.

Atmospheric conditions will not affect our bands as much now as they did when they were tied on by hand, and if it does have any effect it will have the same effect on them all. By tying all of the bands on with the same tension we will not have as much soft yarn going to the weave room, which will make a good saving.

Another saving made by using this device is in getting more production with less power consumption. My reason for saying this is that, as most spinners know from experience and actual tests, we have to adjust our twist by the way only a small proportion of our ends are running. In other words, in all of the tests made on number of ends down, if they are observed closely, it will be found that most all of the ends down were caused by only a small proportion of the total ends. These ends can be checked closely, new rolls put in, the spindles plumbed, rings and travelers checked—and still some of the ends will continue to break down. Why? Because the band was tied on too slack and the end is not getting enough twist and therefore will break down.

It is on account of these few ends that we have to run with at least one more tooth of twist than otherwise. Therefore, I contend that after we get all our bands tied on with these devices we will be able to take out some twist. The reason I say we can run the frame with less power is because all of the bands are running on the cylinder with the same tension and consequently there is not more strain on one part of the cylinder than any other, and the cylinder can run true.

I will give more definite information on these devices in a later article.

Now, there are a few questions I would like to ask the readers, and I will appreciate their answers:

What relative humidity is best to keep in a room equipped with long draft?

What experience have you had with cork rolls on long draft?

Is anyone using the banding device for tying on spinning bands? If so, what advantages does it give over the regular method of banding?

When using long draft, how much extra cleaning is it necessary to do?

(To be continued)

YOUNG TIMER

High and Low Card Flats.

Says that trouble with high and low flats may be overcome by having flats milled.

EDITOR COTTON:

I noticed a very interesting question in COTTON concerning the setting of cards. "CONTRIBUTOR NO. 4838" asked why it is that all cards cannot be set alike and to the same gauge from flats to cylinder?

There is nothing about the cards that is absolutely perfect. Take the cylinder, for example, it cannot be set closer than .003 of an inch; that is, before the clothing goes on it. If card clothing manufacturers get their clothing to .003 of an inch they are doing well. Therefore, there must necessarily be an error of at least .006 of an inch in the setting of the cylinder.

Other conditions that make it next to impossible for two cards to be set alike may be: the screens warped; the plates that control the air draft not being absolutely true; bad grinding rolls that run in a "lope" and dig out low places in the cylinders; worn bearings; and vibration.

The big thing in card setting is the card flat. High and low flats are to be found on all cards that have been run and ground for two years or more. Of course worse conditions will be found where cards have been run for a number of years and where the flats have been re-clothed. This condition is caused partly by flats getting mixed when they are sent to the shop to be re-clothed. It is possible to get some flats that are worn more than others on the same card.

Several years ago the writer decided that there should be a remedy for high and low flats, so we began to look around for the trouble. After grinding the flats heavy for one week, we found that the flats were more uneven than when we began to grind them. Our next move was to caliper the ends of the flat that runs on the arched bend, and to our surprise, we found quite a difference in the thickness of these flats. We marked all the high flats on the card and got them together and ground them by running the flats by hand until they were all the same. These flats performed nicely for awhile, but in two years' time they were as bad as ever, so the same operation had to be repeated.

In my distress, I asked for help from those that re-clothed card flats and finally found a firm that had just installed a machine for milling the ends of card flats. We found this machine to cause the flats to set just as good as new flats. We have had 12 sets of flats milled true and find that we can set much closer than with our old flats. I know of one firm that grinds the ends of flats, but we prefer to have them milled, for such procedure eliminates guess work. If flats are watched as they pass under the grinding drum, it will be seen that some grind more than others. They will never become even until the ends of the flats are milled true.

We are strong believers in having card flats milled true on the ends that come in contact with the arched bend. Anyone adopting this practice will find their carding to be better, and their trouble with high and low flats will be over.

CONTRIBUTOR NO. 5063.

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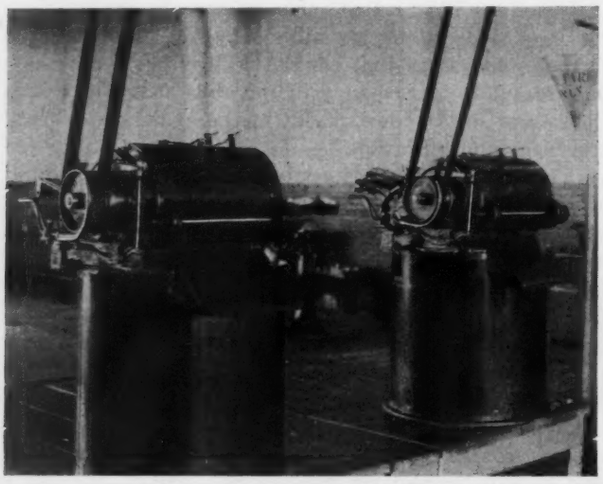

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Preventing Seconds Ahead of the Cloth Room.

EDITOR COTTON:

I should like to comment on the letter from "CONTRIBUTOR No. 4682", on page 64 of the August issue of COTTON on reducing seconds. I agree with him that we should not allow the simplicity of the system he describes for keeping a record of seconds, to detract from our opinions.

But I would like to say that the place to reduce seconds is not in the cloth room. The place to reduce seconds is in the preceding process.

I have made several studies of weaving conditions, not from an efficiency standpoint but from a common sense view that a weaver can only run what is given to him; and although a mill has a weaver who is a peach, he runs his looms fine, no seconds, and the best producer—so we say, or that is some say, that if John Doe can do it, so can Mary Jones, and let it go at that. We do not make a study of the worst so-called weaver in the room, just because he or she is always complaining. Maybe he or she has a reason to complain. I have found it so, and when I make a study I do not time the weaver. I let the weaver do just as he or she would do if I were not there. I listen to all of the complaints. I save all the bum filling bobbins and also the bad warp ends, knots, slugs, etc. I mark the shuttles and watch why particular shuttles are causing all the trouble. I check the loom having the most warp end breakage. I then take the filling bobbins and see what is wrong; soft bobbins, wrong traverse, that is the rail on the ring frame going up fast and down slow when it should go up slow and down fast.

I find sometimes that a fixer will just have a little too much pick on one loom than another, causing the filling to break in the shuttle box. (Too much pick is a term for too much speed or more speed than is necessary to carry the shuttle to the box.)

I find that a lot of slugs are caused by wise spooler tenders opening up slug catchers. I find that cockled yarn is caused many times by the roving traverse on ring frames dwelling a little too long on the heel of the cam causing just a little groove in the leather roller and a lot of cockled yarn is made due to this one cause.

When I get in the spinning room to check these causes I walk around and find the spinner who just can't seem to keep up with the job, and so I tell her to go away for an hour and then I run her side.

Oh, yes. I actually go this far back, and when an end breaks I put a chalk mark on the board over the spindle. When the hour is up, I count my breaks and I find that most of the trouble is due to just a few of the spindles which may be out of line, or a slack band, or a bum ring or a thread guide out of line or one of a hundred other things.

Then I bring the overseer and he brings his second hand (both of them are usually too busy or big to bother with the spinner) and we get the third hand or section hand and believe me, we have cut down a few seconds, helped the spinner, and also helped the weaver.

No sir, you can't run a mill from the cloth room any more than you can from the main office. The help are all human and the one that doesn't kick is usually timid and afraid to do so and the one who does kick and complain, we call radical. I say, let them all kick, then we find out a lot of things that we never knew were happening.

W. B. (MASS.)

Textile School Graduates.

EDITOR COTTON:

It is true that in many instances textile school graduates have been promoted in preference to the practical man, but in most cases it was either due to pull or to the fact that they had good practical men under them who made the good showing, but failed to get the credit. Many men at the head of our cotton mills have had to face the mourner's bench as the result of such promotions.

I know that what I have to say will bring much criticism upon me. However, I think the truth should survive.

Just suppose a textile school graduate is placed in charge of a card room. Of course he can figure the drafts so as to balance each process, but, as all practical men know, there is a vast difference at times in the physical properties of one mixing of cotton as compared to another. Any attempt to work one product with hard fast rules deduced from the previous one will be very disappointing to the textile graduate, for the behavior of one mixing when worked at certain weights, settings and drafts, as well as at a certain standard of moisture in the different departments, is a guide for the next one, but not an infallible rule. Then it is easy to see that the figured drafts amount to nothing in such cases, and, instead of figures, knowledge and experience are required. Therefore, when one process gains on the other, the practical man knows the cause along with the remedy. In other words, he saves money for his firm by catching the heavy or light work before it reaches the beaming stage. The textile student is not equal to the task and for this one reason could be considered an expense.

If any of the following problems should come up (problems which any practical man could answer with ease), I believe most textile students would run into quite a bit of trouble:

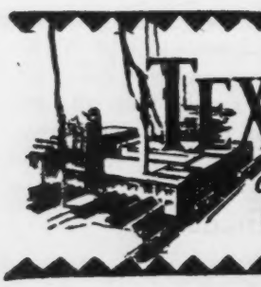
(1) The breaker lap is larger in diameter at one end, although the lap rack and drafts are in perfect condition. What causes the diameter of the lap to be larger at one end?

(2) On the card we have a very high speed doffer and we are making a great amount of waste due to the webs at the front of the card breaking down continually. Is the cause in the comb setting, position, speed, or what?

(3) On the drawing frame some days we have a tight web between the front drawing rolls and calender rolls. Then the next day they run very slack. What causes this?

(4) On a fly frame we have a taper of 27 degrees that causes the roving to run over and under. We have no taper gears on hand to change the taper, but must remedy the trouble. How is this done?

WASH (R. I.)



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The booklets or catalogs briefly mentioned below may be obtained by any readers of COTTON who will write to the Company issuing them or to COTTON, Grant Bldg., Atlanta, Ga.

55. Interpretation of Analysis for the Layman—An eight page booklet explaining what the various terms used in fatty oil and sulfonated oil analysis mean, enabling the ordinary textile man without chemical education to interpret the various chemical analyses. National Oil Products Co., Harrison, N. J.

56. Technical Service Data—giving information on processes of textile manufacture in the use of oils, softeners, etc. National Oil Poducts Co., Harrison, N. J.

57. Reducing Textile Costs and Troubles telling all about the benefits of water treatment. Permutit Co., 440 Fourth Ave., New York, N. Y.

62. Rubber Products for the Textile Industry—a 40-page booklet giving a wealth of information on the proper selection, instillation and operation of rubber belts, together with charts showing horsepower rating, pulley sizes, V-belt sizes, also information on all types of hose and rubber covered rolls used in the textile industry. Manhattan Rubber Mfg. Division of Raybestos-Manhattan Inc., Passaic, N. J.

63. S-W Paint Standardization Plan—valuable booklet telling how protective coatings can effect economies in plant operation and maintenance, describing how each surface is finished to best meet its specific needs, giving ideal lighting and sanitary conditions and economies in increased production. Sherwin-Williams Co., 601 Canal Rd., Cleveland, Ohio.

64. Efficiency and Performance of SKF Boller Bearing Spindles—A twelve page booklet showing the advantages in power consumption, increased production, savings in lubrication, increased yarn breakage strength to be secured through roller bearing spindles. SKF Industries, Inc., 40 East 34th St., New York, N. Y.

65. Why Cooper Hewittt Light is Better Than Daylight—a 16-page booklet explaining in detail the importance of good lighting and the necessity of proper quality as well as proper quantity of light. General Elec. Vapor Lamp Co., Hoboken, N. J.

66. Dronsfield's Patent Portable Auto-Feed Needle Point Grinder No. 176, describing a new departure in card grinding—John Hetherington & Sons, Inc., 250 Devonshire St., Boston, Mass.

69. Monel Metal Equipment for the Textile Industry—a 50-page buyer's guide and catalog with more than 100 illustrations of various items of monel metal dyehouse equipment. International Nickel Company, Inc., 67 Wall St., New York, N. Y.

70. Fafnir Ball Bearings for One-Process Pickers—outlining the advantages of ball bearings in guaranteeing smooth accurate motion particularly on eveners, as well as uninterrupted production, ease of operation and cleanliness of bearing units throughout the one-process pickers. Fafnir Bearing Company, New Britain, Conn.

71. Short Cuts to Power Transmission—A 74-page handbook for belt users, incorporating the most important phases of practical belting practices, including considerations in belt buying, care of belts, making belt joints, belt calculations, causes of belt troubles, etc. Flexible Steel Lacing Company, 4916 Lexington Street, Chicago, Ill.

72. The Merrow Butted Seam—A 16-page booklet defining and illustrating the Butted seam, describing its prop rties and outlining some of the advantages to be gained by its use in textile fabrics. The Merrow Machine Co., Hartford, Conn.

73. New Reeves Catalog T-32—A treatise on efficiency speed control—including valuable information of special importance to textile industry men and production executives outlining advanced methods of speed regulation. Reeves Pulley Company, Columbus, Indiana.

74. Colgate-Palmolive-Peet Bulletin No. T-22—booklet giving complete details of degumming and dyeing in a single bath with soap. Colgate-Palmolive-Peet Co., 919 North Michigan Ave., Chicago, Illinois.

75. The Facts About Armstrong's Seamless Cork Cots—A helpful book containing plain facts, cost studies based on actual mill records, expert analysis, complete details on the advantages of Armstrong's Seamless Cork Cots. Armstrong Cork & Insulation Co., 923 Arch Street, Lancaster, Pa.

76. Jointite Cork Products—Giving information on the uses of cork for insulation purposes. including useful data, specifications, tables, and charts for roof insulation, refrigeration, sound-proofing, heat prevention, heat conservation, vibration deadening, and condensation prevention. It contains concise and valuable data on all of these subjects, as well as photographs and drawings showing specific examples of various types of construction, test curves, etc. Copy sent free to anyone interested in any of these subjects. Mundet Cork Corp., 450 Seventh Ave., New York, N. Y.

77. Bulletin T 200—Illustrating and describing the new Reeves Variable Speed Drive for spinning and twister frames, explaining its many distinct advantages, and giving charted results of exacting tests. Reeves Pulley Company, Columbus, Indiana.

78. Booklet L 1289 A, Loom Motors and Control—giving details of the low installation, operating and maintenance cost of Westinghouse Loom Motors. Westinghouse Electric & Manufacturing Company, Room 2 N, East Pittsburgh, Pa.

87. Morehead Back-to-Boiler System—An interesting 44 page booklet, giving helpful information regarding the Morehead Back-to Boiler System. Morehead Manufacturing Co., Department C, Detroit, Michigan.

88. Dayton Cog Belt Catalog—a 32 page booklet full of vital information on power drives, plainly and simply assembled and arranged so that anyone can select the proper standard drive for any condition. It also provides data for the calculation of drives where acquired. The Dayton Rubber Mfg. Co., Dept. C-11, Dayton, Ohio.

89. Lubriplate, An Important Advancement in Lubrication—describing this new lubricant, its qualities, uses and advantages. Lubriplate Corporation, 405 Lexington Ave., New York City.

1. Cotton Picking, Carding and Spinning—Covered by three different catalogs. Picking catalog covers Opening and Picking Machinery; Card Room catalog covers Cards, Combers and Roving Frames; Yarn Machinery catalog covers Spinning, Twisting, Spooling, Quilling and Reeling. By Whitin Machine Works, Whitinsville, Mass.

2. Pepperell Equipment—10 page illustrated booklet showing High Speed Warping from cones as adopted by Pepperell Manufacturing Company after thorough experiments, installation and product photographs. Issued by Universal Winding Company, Boston, Mass.

4. New Methods of Opening Cotton, also "Brown" Automatic Mixing and Cleaning Distributor — Illustrated booklets showing advantages of Centrif-Air Cotton Cleaning System. Pamphlets also on better picking and carding and pneumatic trunk line cleaner. Issued by Centrif-Air Machine Company, Atlanta, Ga.

8. "Textile Brushes"—10 page booklet illustrating brushes for cleaning every part of mill. By Gastonia Brush Co., Gastonia, N. C.

10. Leathers, Textile—Booklet No. 101, 48 pages. Illustrated. Showing BONDARON Check Straps—Lug Straps—Harness Straps—Pickers—Belting, both round and flat, etc. Horsepower tables and other interesting information. By Charles Bond Company, 617 Arch Street, Philadelphia, Pa.

11. Whitinsville Rings—16 page illustrated booklet. Describing ring manufacture, measurements, types, uses. How to determine flange sizes. By Whitinsville Spinning Ring Co., Whitinsville, Mass.

15. The Powers System of Thermostatic Control—"Slasher Room is Bottle-Neck of Textile Mill." 18 page illustrated booklet showing importance of proper treatment of cloth in slasher room and advantages of Thermostat over hand control. Also room temperature control illustrations. Issued by Powers Regulator Co., 2739 Greenview Ave., Chicago, Ill.

20. Bleaching, Dyeing, Finishing and Printing Textile Goods—70-page booklet containing interesting iinformation on faults and methods in finishing goods, useful tables and definitions. By Bosson & Lane, Atlantic, Mass.

21. Warp Sizing and Composition of Cotton—Folder containing reprints of articles carried by textile publications of interest to progressive mill superintendents. By Seydel-Wooley Co., 748 Rice St., Atlanta, Ga.

22. Tragasol and Its Uses—Booklet, 60 pages, constituents and properties—Dissolving and preparation—sizing and dressing of yarns—cloth finishing—miscellaneous. By John P. Marston Co., 247 Atlantic Ave., Boston, Mass.

23. Practice of Rayon Sizing in American Mills, Raygomm, Lakoe Gum—Three booklets on products for sizing and finishing rayon and other textiles, presented by Stein Hall & Co., Inc., 285 Madison Ave., New York, N. Y.

25. "Lupogum" and "Monopole Oil"—Two booklets on textile sizing and finishing products. Jacques Wolf & Company, Passaic, N. J.

28. Akron Belting.—Practical Rules and general information for users of belting with belting catalog. By Akron Belting Co., Akron, Ohio.

29. Continuous Card Stripper—A 20 page booklet describing in detail continuous card strippers, their advantages, the power required to operate, etc. Saco-Lowell Shops, 147 Milk St., Boston, Mass.

30. Lubrication of Textile Machinery—32 pages, illustrated. Data covering the economical lubrication of all textile machines. New York and New Jersey Lubricant Co., 292 Madison Ave., New York, N. Y.

38. Sleaziness in Full Fashioned Knitting—Illustrated survey with samples of fabric showing causes of sleaziness and methods to be employed in eliminating it.—By Textile Machine Works, Reading Pa. (This company also issues parts catalog for Reading full fashioned machine with general information on subject of full fashioned knitting.)

41. Budget Control—40-page booklet showing how each part of business budget should be prepared and principles of its effective operation together with a summary of benefits. By Ernst & Ernst, accountants, 27 Cedar Street, New York, N. Y. (This company also has available booklets on Standard Costs, Business Control Through Analysis, The Better Wage, Factors to Consider in Working Out Mergers.)

42. Textiles and the Telephone Typewriter—6 page booklet on telephone typewriter service for communication between mills and selling houses. By American Tel. and Tel. Co., Long Lines Department, Atlanta, Ga.

44. Points of Interest in and Around Atlanta—36 pages. Illustrated, describing places of scenic and historic interest in Atlanta in particular, and the Southeast in general. Atlanta Biltmore Hotel, West Peachtree, Fifth, Sixth & Cypress Sts., Atlanta, Ga.

45. Fidelity Universal Ribbers—A forty-eight page booklet showing the advantages and many styles of ribbed fabric and describing in detail and illustrating the latest developments in ribbers. Sent free on request by Fidelity Machine Co., 3903 Frankford Ave., Philadelphia, Pa.

KNITTING SECTION

THE NEW WELT

E~L~A~S~T~I~C! With this new welt, on the Model K machine, you can please the outsize customer and the slender customer, too. It has remarkable "spring"; and this elasticity characterizes not only the welt itself, but the whole top portion of the stocking; there are inches more of *give* • Once the machine is adjusted, there is no need for constant watching; this new welt construction is a fixed, mechanical process and it means easier production • And, of course, the exclusive "Gussetoe" and the new square heel, are other sales features you can have along with this welt on the Spiral K.

"This is the Scott & Williams Machine Age"

ESTABLISHED 1865

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366 BROADWAY, NEW YORK, N. Y.

HOSE FOR ALL OCCASIONS ON THE "STANDARD" 80 WRAP

Sports wear—street wear—dress wear . . . whatever the consumer requirement, it can be met in an attractive and appropriate design with half-hose made on the Standard 80 Wrap. This machine's versatility gives you *style* leadership; its mechanical proficiency gives you fabric *quality* that recommends itself!

What's more, on the 80 Wrap you have the advantages of the exclusive "Gussetoe"—fine gauge—and the possibility of using any yarn construction.

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Pattern flexibility, and the fact that any number up to 80 of adjacent needles can be wrapped, are clearly illustrated in the two "80 Wrap" designs shown.

From both a mechanical and a sales point of view, the Standard "80 Wrap" is the most advanced wrapped embroidery hose machine on the market.

STANDARD TRUMP

Established 1872

STANDARD-TRUMP

BROS. MACHINE CO., INC.

366 BROADWAY NEW YORK, N. Y.

Time Study and Rate Setting for a Full-Fashioned Plant

By E. J. Doerr
Engineering Dept., Ajax Hosiery Mills.

A DETAILED description of how time studies of various operations are made, and the rates set as a result, in a well-known full-fashioned hosiery mill, is given in this well-written discussion . . . . . .

THE higher the degree of skill required for an operation the greater the need of having a study taken in order to determine the amount of work which should be produced under certain conditions within a given time. Today the manufacturer is faced with the problem of keeping his organization intact and if possible, operating at a profit. In order to do this he must know his costs thoroughly; and as direct labor is one of his major costs he should have a scientific control of this element. The setting of rates, using time study as a basis, gives this necessary control. The benefits of taking a time study for rate setting cannot be too highly stressed, however, it is unnecessary to explain these advantages in detail as they are obvious to all of us.

The Factors

In order to establish rates by time study we must take into consideration all of the elements necessary to produce the merchandise. For the purpose of illustration let us trace the setting of the rates for a 45-gauge 4-thread lace top style on the legging operation alone. The first step is that the specifications for the style must be definitely decided upon by the management and a running test made in order to assure proper manufacturing results. If this is approved, a copy of the specifications is obtained

Style 800

45gg	9-21-32
Picot	177
Enter large zig-zag border	197
Enter small zig-zag border	344
Turn welts	357
Enter 4/1	360
Enter leg narr.	1000
Enter splicing	1408
First Step	1444
Enter 80/2	1530
Loose Course	1626
End set	1646

Courses per inch		*Slacker*	
Welt	6/1 38	Welt	12 nicks
Leg	4/1 48	Heel	9 nicks
Splic.	6/1		

Fig. 1.

which will give the required information on the style. While considering it, we must note that the manufacturing of the leg on the legging machine is divided into a number of parts. When taking the time study the operation has four distinct elements, namely the *running time*, the *service time*, the *service contingency*, and the *silk and yarn contingency*. This means that there are two tangible elements and two intangible or variable elements to be considered. The two tangible elements, *running* and *service* time, may be readily determined; however, the variable elements can be obtained only through study and a series of observations and tests from which the standards may be set.

To see exactly how the study is obtained we will start from the beginning and set up the standards. Fig. 1 shows a course card, the purpose of which is to inform the operator when the changes are to be made on the machine. Therefore if we look at this card we have a record of the number of courses or stitches in the stocking and we must also obtain the number of dips necessary to make the picot, lace designs and narrowings. An illustration of a standard calculation is shown in Fig. 2, where we find that the course card has been completely copied. The next column shows the intervening courses or the number of courses between each change and the sum of the intervening courses naturally equals the total courses plus the dips.

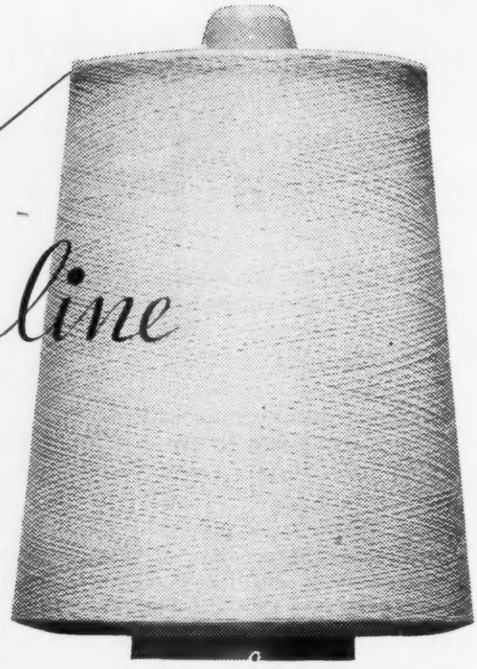
The Actual Study

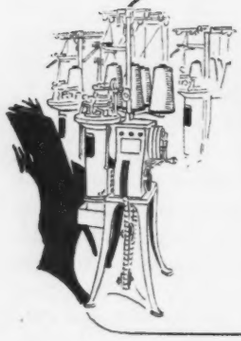
We are now ready to go out to the machine and make the observations for the time study. Upon going to the machine to make a time study the first essential is to inform the operator that a time study is to be taken and that he is to work at his usual pace, stop for menders and any other items necessary in the manufacture of the style, in short, to operate in his customary manner. This is done with the intention first of all of getting, first, the co-operation of the operator and, secondly, a time study which is representative of conditions as they exist.

At all times when the machine is operating it is going at the standard number of courses per minute. It is therefore essential that the speeds be standardized. Of course the speeds will vary according to the style, and it is desirable that the experiments should be made in order to determine the most efficient speeds at which the machine should operate. Then all of the machines should be standardized accordingly.

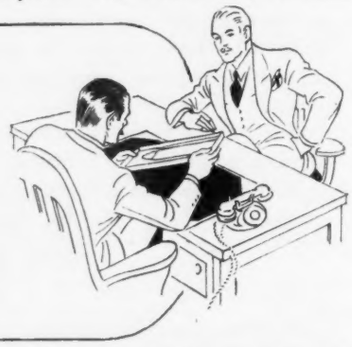
A knitter should be positively prohibited from changing the speeds on the machines. It has been found from experience that if this rule is not strictly

You Can Count on CHARDONIZE all along the line





From the moment the uniform, well-wound cones come into your mill, on through every process of manufacture and selling, Chardonize dull lustre yarn will contribute to your chances for profit. • Ask fixers and knitters about the running quality of Chardonize. They will tell you, "Fewer breaks", "Smoothest yarn we ever had on the machines", "Saves us time". • Then when your merchandise is ready for the market, show the Chardonize label to buyers. You won't have to sell the yarn-quality or fashion-rightness of your product. The label will do that. For it is the merchants themselves who first acclaimed Chardonize nationally—who are today promoting Chardonize in their stores—advertising Chardonize by name to millions of women from coast to coast. Their efforts are part of a concerted market expansion program to strengthen even further the preference for Chardonize stockings and underwear.



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It's in the yarn

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MAKERS OF VISCOSE, NITROCELLULOSE AND ACETATE YARNS

Tubize

LEG KNITTING STANDARD
Style 800-58 45 gg

DESCRIPTION	COURSES	INTERVENING COURSES	C. P. M.	RUNNING TIME
One inch at low speed	38	38	44	.86
Enter lace	197	159	60	2.65
Remove lace	223	26	44	.59
Enter Lace	344	121	60	2.02
Remove lace	352	8	44	.18
Turn welts	357	5	44	.11
Enter 4/1	360	3	60	.05
Enter splicing	1408	1048	60	17.47
Enter 80/2	1530	122	44	2.77
Enter heel	1534	4	44	.09
Remove 80/2 carrier	1540	6	43	.14
End of set	1646	106	43	2.47
Picot dips		25	44	.57
Flare narrowings		6	60	.10
Leg narrowings		33	60	.55
Heel narrowings		8	43	.19
				30.81

Service Time in Minutes

Start up	3.00
Four cam changes @ .10	.40
Turn welts	3.50
Enter main silk	.25
Enter splicing	1.00
Enter 80/2	.10
Enter heel	.16
Remove 80/2	.10
Press off set	2.00
	10.51

Summary

Actual running time	30.81
Lace allowance	.25
Service time	10.51
Silk and yarn allowance	3.75
	45.32

Hour Rate 26.48

57½ Hours—100% 63 10/24
80% 50 18/24

Fig. 2.

enforced the machines will be damaged as there are always men who will run at improper speeds in the splicing or run the machine faster than it is intended to run. The speeds at which we get the best results are 60 courses per minute in the welt, 60 courses per minute in the leg, and 44 courses per minute in the splicing. In most cases a variation of more than two courses per minute will necessitate a change in the standard.

In order to determine the number of courses per minute that a machine is making there is a choice of two methods. You may either count the carrier as it goes across the head and add to that the lace or narrowing dips as they are made, or count the revolutions per minute on the cam shaft. Every time the cam shaft makes one complete revolution it is either a course or a dip. The method which has proven most satisfactory is that of counting the revolutions per minute of the cam shaft and obtaining the number of cam revolutions per minute. This eliminates the possibility of error which exists in counting the courses made by the carrier.

In the style on which we are making the study there are four different speeds. In the welt for the first inch we have 44 courses per minute, then, in the balance of the welt and leg 60 courses per minute; in the splicing 44 courses per minute; and in the heel 43 courses per minute. Therefore, the cam revolutions per minute should agree with these figures and these speeds will be used in calculating the standards. Upon checking our speeds, we are now ready to start the study.

As soon as the operator picks up the last stocking of the previous set the watch is started and runs continuously until the set is completely finished, which means until the last finished stocking is picked up on the set under consideration. Fig. 3 illustrates a copy of the form used in making a time study. On this sheet is recorded the time that the machine stops and starts. Under the explanation column the causes of the stops are written in, and in that manner every time the machine is stopped a record is kept, and at the end of the set we have a record of two things; first, the amount of time consumed in running, and, second, the amount of time consumed while the machine is stopped with an explanation of what occurred during that time. The "C" on the sheet means continuous time and the "I" means intervening time. The intervening time is that time between any two stops. It tells you how much time was consumed from the time the machine was stopped until it was started again. The information at the top of the sheet gives the necessary details in order to properly set the standards.

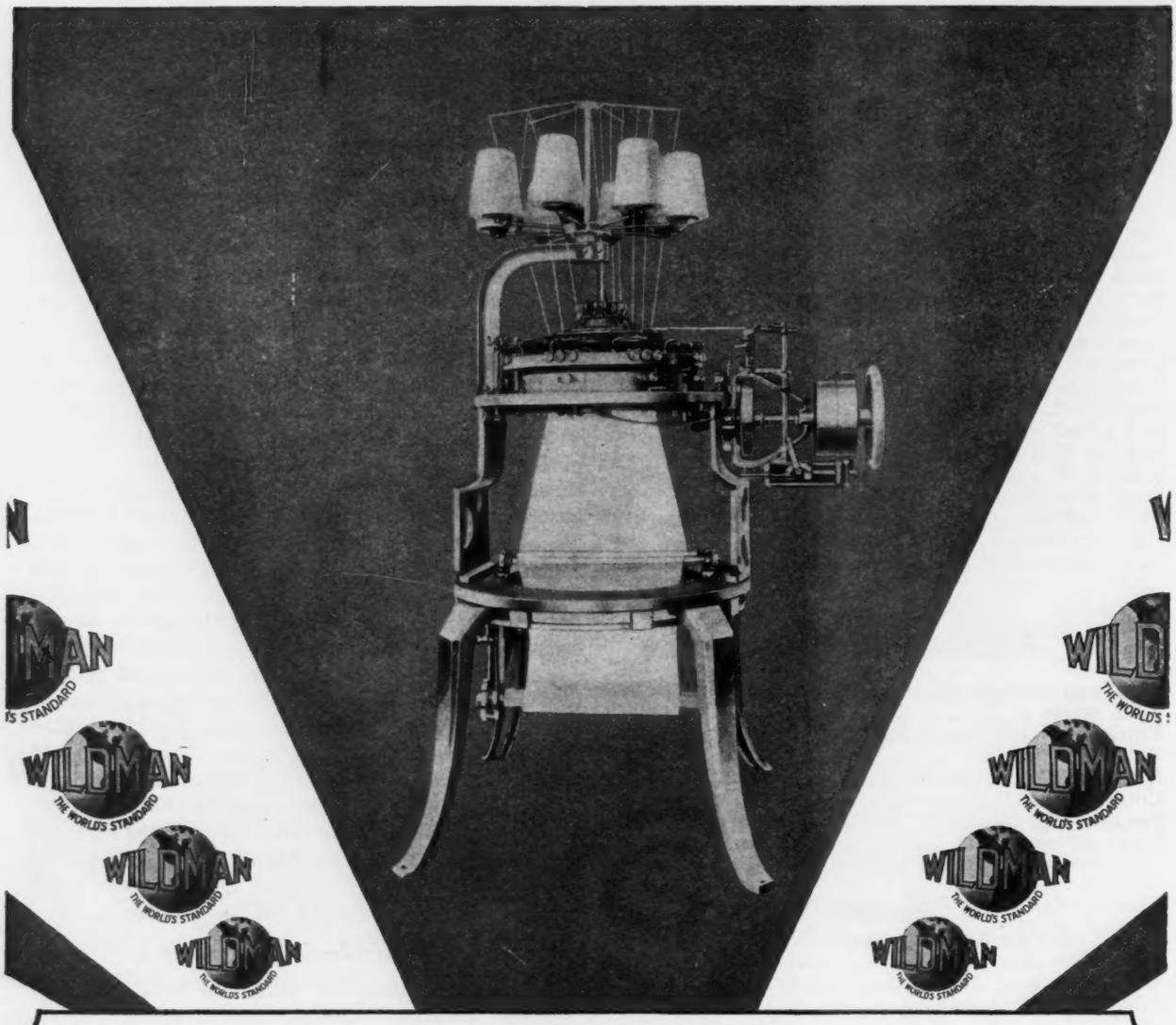
Methods of Operation

During the course of taking the time study the operator is watched very carefully in order to determine if he is using the best methods of making his changes and if his machine is being run properly. It is especially important that a knitter have a quantity of pliered needles on hand at all times. Should it be necessary for him to plier his needles while his machine is stopped due to broken needles, the amount of delay is much greater than it should be.

Upon completion of the actual time study we are ready to calculate the theoretical standards. When the proper speed is obtained it should be entered on the standard sheet for calculation of the running time. This is obtained by dividing the courses per minute into the intervening courses. There can be no question on this point as it is purely a mathematical calculation. However, we must bear in mind that unless the courses per minute are standardized on all the machines there will be a great deal of dissention among the operators. This may defeat all the benefits that it is possible to derive.

Service Time

We must next consider the service time or the time required by the knitter to make the changes while the machine is stopped, and any operations performed while the machine is running are not credited directly to the knitter for a time allowance.



For rayon—operates at lower cost with less needle breakage—no raveling waste—imperfections reduced to a minimum.

WILDMAN MANUFACTURING CO.
Norristown, Pa.

WILDMAN
THE WORLD'S STANDARD

WILDMAN
SPRING NEEDLE BODY MACHINE

Therefore, the management insists that the operators make as many changes as possible while the machine is running. It is advantageous to the management to have the machines set for as many automatic changes as possible when running. These automatic changes may be set up through the narrowing chain or the lace chain; for example, the entering of the picot, starting of the lace in the welt, narrowing, etc. The efficient knitter realizes that this is to his advantage and governs himself accordingly.

There are a number of operations which are identical on all styles; for instance, turning welts, entering the main silk, entering the splicing, heel, ravel courses, and pressing off the set. Standards are set up for the operations which are the same on all styles. These are used in all calculations and reduce the amount of work required to obtain the standards. On all new operations a number of observations and calculations have to be made from the results from which a standard can be readily obtained. In Fig. 2, under "Service time in minutes" we have illustrated all the operations necessary for the manufacture of that style together with the standards for the operations. Fig. 3 illustrates an actual time study taken on the machine and this is compared with the standard time study set up. If it is within reasonable nearness and the difference can be explained, it is accepted as being a normal study.

OBSERVATION SHEET

WORKER'S NAME Jones T. MACH. Nº 68 GAUGE 45 SPEED High STYLE 800 DATE 9/21/32

QUALIFICATION OF WORKMAN Good ATTITUDE Cooperative EFFORT Good

QUALITY OF WORK O. K. PRESS OFFS 1 COURSES PER MINUTE Welt-60 Leg-60 Spec-40

REMARKS: Humidity & Temperature O. K.

DETAIL OPERATIONS		C	I	C	I	C	I	DETAIL OPERATIONS	C	I	C	I	C	I
Start Up	G	3.10	3.10											
Cam Change	S	6.69	3.59					Enter Ravel Courses	S 37.83	2.91				
	G	7.31	.62						G 37.98	.15				
Cam Change	S	9.37	2.06					Enter Heel (Carrier not Threaded)	S 38.09	.11				
	G	9.60	.23						G 39.11	1.02				
Turn Welts	S	9.75	.15					Remove Ravel Courses	S 39.28	.17				
	G	14.00	4.25						G 39.49	.21				
Enter 4/1	S	14.06	.06					Press off Set	S 42.07	2.58				
	G	14.34	.28						G 45.74	3.67				
Broken Needles (Narr)	S	29.06	14.72					End of Set	46.06	1.32				
	G	31.16	2.10											
Enter Splicing	S	33.59	2.43											
	G	34.72	1.13											
Enter Broken End	S	34.80	.08											

FIG. 3

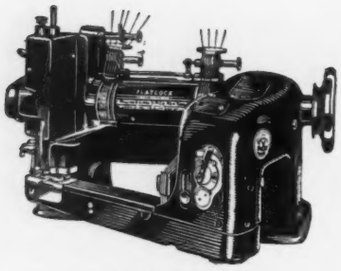
Contingencies

We next have the service contingency time under consideration. Here we get into the variable field and one of arbitration. We mean by this that allowances must be made for trouble that is expected to arise such as broken needles and minor difficulties with the machine. In order to determine this a number of tests and studies must be made, and also the experiences of the foremen and superintendents are consulted. From experience with previous studies it has been found that on plain work 25 per cent of the service time is required for contingency, while an additional allowance of .01 for each lace dip is necessary. This contingency takes care of such items as broken needles, sinkers, and all delays caused by the average manufacturing difficulties which may arise. The allowance will vary in different mills according to the ability of the knitter and to the difference in conditions which prevail. If we refer to previous time studies we find that generally the knitters run very close to the service time standards. The efficient knitters do not require the entire time allowance, however, the standard must be set up for the man of average ability, working under average conditions. This service time will not take care of the occasional smash or the mistakes that a careless knitter sometimes makes.

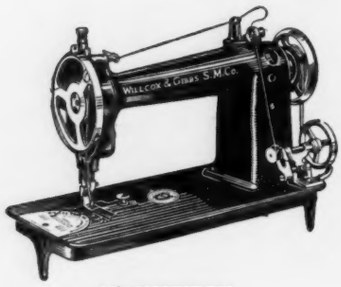
Silk and Yarn Contingency

The silk and yarn contingency provides an allowance for press-offs, tying up bobbins and any silk trouble which may arise. We have different allowances for different types of silk. On plain work the allowance is three minutes for 5-thread, three and a half minutes for 4-thread, and five minutes for 3-thread; while on lace top work the allowance is increased according to the number of picot dips in the design. The silk and yarn allowance will probably vary in different plants under different conditions. If the silk is handled carefully and has the proper humidification this allowance should prove ample. Upon obtaining this information we are ready to obtain the standard production. If we add all the elements together, namely the *running time, service time, service contingency,* and *silk and yarn contingency,* we have the standard time for one set. By dividing into this time the number of sections on the machine used for the study, we will obtain the time necessary for one stocking. If we divide the time for one stocking into sixty minutes, we will have the number of stockings required to be produced in one hour. By multiplying this by the number of hours worked per week and dividing the result by twenty-four stockings (one dozen) we will have the number of dozens required for a working week of 100 per cent efficiency.

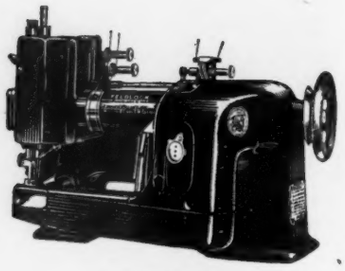
There are certain qualifications necessary if the time study man is to secure the desired results. He is really the representative of the employees as well as the management. It is his duty to see that no rate goes into effect which is beyond the capacity of



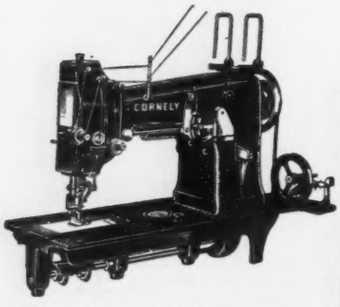
FLATLOCK



LOCKSTITCH



FELDLOCK



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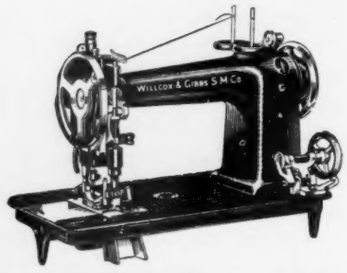
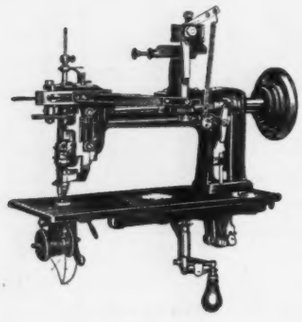
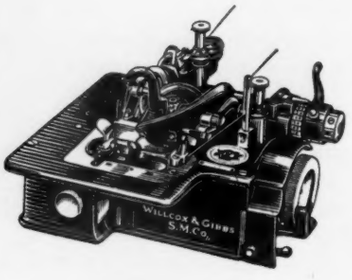
FOR PRODUCING PROFITABLE MERCHANDISE



LOCKSTITCH TRIMMER & BINDER



CORNELY



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the operators. He must have a pleasing personality, be tactful, and also have enough strength of character to be able to stand his ground when a decision has to be made. Patience and the ability to exercise sound judgment are absolutely essential in order to secure and hold the respect of the operators.

The time study man should have at least a high school education and should fortify himself with a fundamental knowledge of the operations which he is required to observe. If he attempts to do this important work without adequate preparation regarding the practical phases of the knitting operations, the purpose will be defeated and much dissention will be the result. To be successful, time study work must be practical.

Setting the Rates

One of the most important advantages of time study is the fact that the element of guess work is practically eliminated. Regardless of the method of wage payment in effect the standard may be used.

We have the machines divided into various classifications, such as 45-gauge lace top, 42-gauge lace top, 45-gauge plain and 42-gauge plain. Every gauge has a separate standard wage set up for it at 80 per cent efficiency. In the style under consideration, we have considered a 45-gauge lace top high speed number. For purpose of illustration we will assume that the basic wage is $35.00 at 80 per cent efficiency. The standard shows that 63 dozens are required at 100 per cent efficiency. We take 80 per cent of the 100 per cent standard which amounts to 50 dozen. We divide this into the basic wage and find that the piece rate is $.70, and every dozen that an operator makes on this style will be paid at this rate.

Regardless of what style is made on the 45-gauge lace top high speed machines the basic wage remains the same. Should we put in a different lace top style, requiring, for example, 45 dozen at 80 per cent, this would be divided into $35.00, and the rate per dozen would then be $.777. This is worked out on the principle that any knitter on a 45-gauge high speed lace top job at 80 per cent efficiency according to time study will receive the basic wage, namely $35.00.

Attitude of Employees

Due to the fact that the administration of our time study has been given much careful consideration our employees have a favorable attitude toward the time study method of settling rates. When the rates are set for a new style, all the operators working on that style come to the engineering department to discuss the standards which have been set up. The superintendent is present and acts as an arbitrator and the standard is thoroughly analyzed. Should there be any points about which questions might arise, a new study is made and if the results seem to justify it a new standard is worked out.

MACHINE N° 68 DATE 9/21/32
CLASSIFICATION Legger
STYLE 800 JOB Single GUAGE 45
NORMAL RATE .700
NORMAL WAGE – 57½ HOURS 35.00 NORMAL PROD. – 57½ HOURS 50
TIME WORK RATE PER HOUR .548

FIG 4

In this manner the employees have grown to respect the time study. Their confidence is also maintained due to the fact that they have the privilege of going over the study at any subsequent time. A card is put on each machine as illustrated by Fig. 4 which shows the rates to the operator and how they are calculated together with the rate for time work. This, incidentally, is 90 per cent of the basic wage hour rate.

Our machines are constantly checked for courses per minute and quite frequently the operators ask to have their machines checked if they feel that they are not running according to standard.

In conclusion, we can say that the time study method of setting rates has eliminated many misunderstandings in our plant. All adjustments of wages are made on the basic wage. The standard is never adjusted after it has been set unless a new condition arises regarding the manufacture.

Additional Patent on Multi-Design Machines.

On November 8, 1932, U. S. Patent No. 1,887,413, the third one issued up to the present relating to the invention of pattern wrap stripe designing and mechanism on circular rib machines, was issued to Walter Larkin, assignor to the Fidelity Machine Company. The present patent covers the invention of a selvage welt in conjunction with wrap striping on circular rib fabrics. On August 5, 1930, Fabric Patent No. 1,772,400 was issued to Mr. Larkin, covering the invention of circular rib fabric with stripe designs; and on January 12, 1932, Patent No. 1,841,249 was issued, covering the design of the machine for producing this fabric.

:: :: ::

Hemphill Offers Combination Machine Universal Stitch and 12 Step.

Hemphill Company, of Pawtucket, R. I., are offering the new Banner combination machine which combines all the features of their long established 12-step reverse plaiting machine together with those of their newer Universal stitch machine.

The company claims that the Banner combination machine will knit three-color work, mesh and reverse plaited effects, mesh patterns and mock wrap patterns on reverse plaited fabric. A number of samples of these various combinations are on display at the company's sales office, 93 Worth Street, New York.

On this new combination machine reverse plaiting machine work is entirely controlled from a 12-disc pattern drum with a single cam adjustment. A similar pattern drum controls the universal stitch equipment and three color work is obtained by co-ordinating the two pattern drums in action.

It was stated by an executive of the company that the Banner combination machine will be made in all cylinder sizes from 2-inch to 3¾-inch.

The YARN MARKET

Philadelphia, Pa., November 21, 1932

COTTON yarn traders believed toward the end of November that there were some sizable orders for carded numbers in the foreground, but there was indicated some doubt that much business would be written in December. Yarns were given support by approximate price steadiness in the cotton markets, but manufacturer interest in yarns for future requirements was lacking. This was ascribed in part to skepticism of cotton values as registered on the exchanges.

Some weeks back, manufacturers were figuring on placing yarn contracts for both weaving and knitting numbers, and dealers were encouraged to believe orders would be forthcoming in due season. They eventually were offered, but by that time, it is related among yarn merchants, spinners had marked their prices for carded up a half cent a pound. This was said to have aroused suspicions in the minds of buyers and they deferred some intended substantial commitments. Much of the business lost at that time is said to have not been retrieved.

Some of the cotton yarn dealers confess they are not quite sure of cotton values holding steady and are hesitant to recommend customers as to the better course to pursue in the matter of contracting. One of the more outspoken, who believes in a future for cotton at higher prices, said quite recently it appeared to him that large cotton interests were supporting the market for the raw fiber, that a little later they would withdraw that support, and late in December or in January engage in a buying movement that would send values ballooning. All of which, accepted as a yarn merchant's perspective, works out as probably more confusing than illuminating on the subject of taking on yarns for a long pull.

For some days after the November crop conditions report and estimate of the bale crop came out it appeared from fluctuations within narrow limitations that the trade suffered no alarm over an indicated addition of several hundred thousand bales to the previous estimate of the year's yield. But weaving numbers behaved badly, receiving perhaps the lightest support in November accorded them in a long time.

There has been a disparity in quotations which reflected the greater demand in the carded knitting group. Had the looms supplied by the Philadelphia trade consumed their relative share of yarn, prices for both weaving and knitting might have gone to higher levels.

Some sizable business in carded on cones was placed in the week of the November election, sellers accepting 13 cents for 10s single, and at least one lot reported as having been let go for a fraction less. Carded knitting numbers were believed to have been bought well ahead, but late in November inquiries continued to reach dealers, buyers generally indicating a need for spot delivery. November later demand ran to the finer counts, for light weight underwear, business in heavy weights being then in the background.

Some important Philadelphia traders were disappointed with the late start accorded single combed peeler yarns, fall demand usually developing weeks earlier than this year. Sellers continued to ask the list prices for combed, getting little business at arbitrary quotations, however. Underwear mills are doing some buying.

November sales of mercerized yarn were regarded as not of sufficient poundage to test the market. Pending reaction of buyers to the list, sales are reported at varying prices. Local interests reported no new business of moment, deliveries against contracts being fair, however. There appears quite a gap between the quotations of one or two leading independent mercerizers and the durene group, and at least one independent has been operating to capacity and shipping heavily to hosiery mills.

Philadelphia prices published November 17th follow:

Single Skeins.

4s to 8s	12½	10s	13
12s	13½	14s	14
16s	14½	20s	15
24s	16½	26s	17½
30s	18½		

Single Warps.

10s	13½	12s	14
14s	14½	16s	15
20s	15 @15½	26s	18
30s	19		

2-Ply Skeins.

8s	13	10s	13½
12s	14	14s	14½
16s	15	20s	15 @15½
24s	17	26s	18
30s	19	40s	25

Two-Ply Warps.

10s	14	12s	14½
14s	15	16s	15½
20s	15½ @16	24s	17½
26s	18½	30s	19½
40s	25 @26		

Frame Spun Carded Cones

8s	13 @13½	10s	13½ @14
12s	14 @14½	14s	14½ @15
16s	15 @15½	18s	15½ @16
20s	16 @16½	22s	16½ @17
24s	17 @17½	26s	17½ @18
30s	18½ @19	40s	25 @26
30s double carded			21 @21½
30s tying-in			18 @18½

Carpet Yarns.

8s and 9s white warp twist	13
8s tinged tubes	12
8s part waste	11

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	24	20s	25
24s	26	30s	30
40s	34	50s	39
60s	45	70s	55
80s	65		

Single Combed Peeler Yarns on Cones.

10s	20¼	14s	21¼
16s	21¾	18s	22¼
20s	22¾	24s	23¾
30s	26¾	36s	30
38s	30¾	40s	31¾
50s	37	60s	43
70s	53	80s	63

Mule Spun Carded Yarn on Cones

10s	19½	12s	20
14s	20½	16s	21
18s	21½	20s	22
24s	23	28s	24
30s	25	40s	32

Mule Spun Combed Peeler Yarn on Cones.

10s	25	12s	26
14s	26½	16s	27
18s	27½	20s	28
22s	29	26s	30
28s	31	30s	32
36s	34½	38s	36
40s	37		

To produce needles as nearly perfect as possible is the business of this company . . . needles that do a maximum of work, cause a minimum of trouble. And for this job, we see more and more the value of *mechanical* control. We rule out the "by hand" element . . . the chance of variations. Torrington needles are made by machines . . . smooth-running, untiring, true; and so these needles are *precise.*

Send your bars to the Torrington branch at 1640 Fairmount Avenue, Philadelphia, for a complete re-needling service

TORRINGTON *SPRING BEARD* **NEEDLES**

A Banner Wrap Stripe machine from the Hemphill Company.

Half-hose by the Wovenright Knitting Company.

"BY THE COMPANY THEY KEEP"

Association tells a significant story of Torrington needle reliability. Here are attractive half-hose by Wovenright . . . made on a Hemphill machine . . . and the needles used were Torringtons. The needles, the machine, the product all pay each other the compliment of "good company".

The Torrington Company

ESTABLISHED 1866

Torrington, Conn., U.S.A.

BRANCHES:

THE TORRINGTON COMPANY,	1640 FAIRMOUNT AVE.,	PHILADELPHIA
THE TORRINGTON CO., INC.,	140-144 W. 22ND STREET,	NEW YORK, N. Y.
THE TORRINGTON COMPANY,	19 W. JACKSON BLVD.	CHICAGO, ILLINOIS
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LOS FABRICANTES UNIDOS,	964 CALLE BELGRANO,	BUENOS AIRES

FACTORIES AT:

TORRINGTON, CONN. • UPPER BEDFORD, QUEBEC
COVENTRY, ENGLAND • AACHEN, GERMANY

TORRINGTON *Latch* NEEDLES

A Discussion of the Parts of Scott & Williams Knitting Machines

(This continues the series of short articles discussing the machine parts on Scott & Williams machines, by taking up in order the various plates in the manufacturers' catalog with which all men using this make of machine are familiar. The first article, on page 126 of the October issue, covered Plate I, Plate II, and Plate III; and the second article, on page 86 of the November issue, covered Plate IV. The present article takes up the parts shown on Plate V. It is suggested that in reading these discussions, the reader turn to the plate in question in the catalog and refer to it while reading the comments found in these articles. Furthermore, it will be a good idea to clip these discussions and file them in the catalog along with the plates to which they refer.

The numbers in parentheses following the names of parts are the same numbers used by the manufacturers in referring to the parts in the catalog.—The Editor.)

Plate V.—Scott & Williams

EDITOR COTTON:

There are quite a number of parts on a Scott & Williams machine which of necessity are hidden from view, and no doubt for this reason they receive little or no attention until they actually give trouble. The stitch regulating lever (6042) in most cases gets *all* of the attention it will *ever* receive when the assembly man at the factory gets through with it and places it on the lever shaft (6505). Frequently the stitch regulating fingers (6557-6757) will not respond readily to adjustment by turning the finger adjusting screw (15282). At times this may be caused by the fingers being gummed up with old hardened oil or by the finger regulating screw (15249) binding too tightly on the finger. It should be kept in mind that the stitch regulating fingers are made to travel a reasonable distance inward and outward, however, trouble will develop if this adjustment is abused. If it becomes necessary to turn most of the adjusting screws (15282) completely inward or outward to get the desired stitch or fabric, there is a possibility of throwing the fingers out of proper relation to the drum cams. In such cases, the stitch lever adjusting screw (10021) should be used, as it was put there to take care of such a condition. Keep the stitch regulating lever shaft set screws tight to avoid uneven length in leg and foot.

Be sure that the lower finger bar guide plate (7017) is tight on the shaft. Various troubles such as bad yarn changes, broken needles, broken dial jacks, etc., are caused by the numerous thrust bar springs pulling upward on a loose plate, and this causes the thrust bars to bind and give trouble.

The driving gear shaft gland should be kept tight to the frame of the machine as it carries a heavy burden of power transmitted to the segment gear (6007) through the high speed gear (6321), drive shaft, (6501), and drive gear (6022). Considerable expense in both machine repairs and fixers' time, also losses in production, can be avoided if the set screws in both gears (6321-6022) are checked for looseness at regular intervals. Machines left to run with these set screws loose will ruin the keys (15701-15700), wear out the key seats in the gears, and put a heavy strain on the segment gear (6007) and connecting link (6023).

The various gears, screws, shafts, studs and bearings—in fact all parts that have to do directly with the reciprocating mechanism—should be kept in good shape, otherwise broken connecting links (6023) or broken segment gears (6007), also broken teeth in drive gear (6022), will result. The two connecting link studs (6550-6551), seldom give trouble if they are lubricated regularly and the nuts kept tight.

The main pawl (6024) should work freely on the stud (6554) and the oil hole in this important place should not be overlooked. The main pawl plate (7001) is one of the usually forgotten and abused parts on a Scott and Williams machine. By that, I mean that this particular part gets very little attention in comparison to the service it must give. Constant pressure against this plate means constant wear and it must be remembered that every move the pattern drum makes is entirely dependent on positive main pawl and plate movement. By re-shaping the main pawl plate when it becomes slightly worn, and moving it forward far enough to compensate for the amount worn or polished off, the drum movement can be kept uniform at all times. A great deal of machine trouble can be avoided if this one thing is given serious thought and followed up carefully.

How many pattern cams, cut off cams, loose course cams, tension cams, steel drums, etc., have been cut off, due to neglect of the main pawl plate being properly adjusted? Machine troubles causing broken needles, waste and seconds traceable to improper main pawl plate adjustment or improper drum movement are numbered by the dozen. This is es-

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pecially true of E S, H H, K and other models having so many automatic features which depend upon positive drum movement.

What has just been said about the main pawl plate, in regard to mis-use or neglect, is also true of the chain pawl (6025) and plate (7002). Constant wear here means constant checking up, re-shaping and re-adjusting, otherwise trouble will surely develop. Does it seem possible that a chain pawl plate would make 150,000 moves in a week? Well, it does more than that on a ladies' fine gauge hose machine such as a Model K, for example. The following figures, which I have before me at this writing, were taken from a 280-needle Model K machine running 6-thread leg and foot, plaited hem and mercerized heel and toe. It had 190 chain links all told. At three moves of the pawl per link, 24 stockings per dozen, two dozen per day, and 5½ days per week, it amounts to 150,480 moves ($190 \times 3 = 570 \times 24 = 13{,}680 \times 2 = 27{,}360 \times 5\frac{1}{2} = 150{,}480$). Now multiply this by two for a night run, and it gives a fairly good picture of what a chain pawl plate must endure in one single week.

I have often heard machine fixers complain about chain pawl plates wearing out too soon, when they hadn't looked at one for two months or more unless it failed to move right. The chain pawl itself requires little attention other than a regular lubrication so that it will operate freely on the pawl stud (6553). Frequently a pawl will become broken by a pattern chain getting stuck, usually the pawl plate will bend or break before the pawl does.

The main pawl stop (5930) should be set high enough so that it will not interfere with free movement of the main pawl, and at the same time prevent the main pawl from bounding upward and striking belt shipper shaft (6502) shown on Plate IV. Frequently the pawl stop screws (15278) will work loose and allow the stop to ride the pawl. This will give trouble if not corrected.

The drum gear (6030) is not troublesome, however, small screws, nuts, parts of broken coil springs, etc., will fall into this gear and cause a machine to get stuck. Great care should be taken in such cases not to force the gear to turn, as it may break the teeth and throw the whole machine out of time and in many cases if forced too hard, damage the other driving mechanism in the machine.

The oil hole in the drum shaft collar (6031) should not be overlooked. The drum (5217) and drum shaft (6504) will give indefinite service barring accidents or abuse. In removing and replacing the various gears such as (6022) or the segment (6007) it is a simple matter to time or mesh the respective gears properly.

The gears on Plate V, as well as those which mesh with those shown on other plates, are all plainly stamped with the letter O on the side of the teeth and it is easy to find the marks and mesh the various gears quickly.

It may be of interest to some of the young fixers (I mean young at fixing) to know that some of the parts shown on Plate V have been changed during recent years. In the older Scott & Williams machines, the stitch regulating lever (6042) did not have the adjusting screw (10021) and for this reason it was more difficult to adjust. The drive gear (6022) had two headless screws in the end of the shaft (6501) to hold the gear to the shaft. This was a poor arrangement and gave a lot of trouble, especially if the machine were run fast. The present arrangement of set screw, key and key seat is ideal. The chain pawl plates (7002) of a few years ago were too light and were easily bent; now-a-days much heavier plates are being furnished and consequently they stay put much longer.

The next discussion in this series will cover the parts shown on plates VI, VII and VIII of the Scott & Williams catalog.

CONTRIBUTOR No. 6038.

Consumption of Needles, Sinkers, Parts On Full-Fashioned Work.

Look up the question this man is answering, and give us your figures, whether full-fashioned or seamless.

EDITOR COTTON:

In reply to the questions of "CONTRIBUTOR No. 6141" (page 125, October COTTON) relative to the cost per dozen stockings made for needles, sinkers, machine parts, etc., will say that his inquiries as to the cost of needles, sinkers, and points individually are more irrelevant than practical. (I am replying on the basis of a full-fashioned mill.) Our machinery supply accounts are kept in such a way as to make it thoroughly possible to quickly find out how many needles, sinkers, points, etc., are broken over any given period. And we keep such information for comparative reasons. However, no particular advantage is shown in isolating the cost of all of these different parts into average cost per dozen. As a matter of fact, all of the various costs as outlined by the inquirer have to go into the cost of producing hosiery, so we list all the different items under "Machinery Supplies" and get the average cost per dozen for all the different supplies rather than by items.

We have 42- and 48-gauge machines. We have at different times operated some of our machines on cotton, straight rayon, combination yarns of silk and rayon, and silk and wool. We have found very little difference in the average cost of supplies per dozen regardless of material or gauge of machine, that is, when the knitting machine is set up to a yarn and a stitch construction suitable to the gauge of the machine. In other words, a 48-gauge machine adjusted to a stitch construction and yarn diameter suited to its gauge will break no more needles and sinkers per dozen than a 36-gauge machine relatively adjusted. And we find the average cost per dozen of all machine supplies as listed by your inquirer to run around eight cents per dozen.

We also know that an average needle breakage of one needle per dozen is a very low average, and an average of two needles per dozen is not totally bad. We also know that full-fashioned needles are being bought today with a spread of $5.00 to $6.00 per thousand difference in cost for needles of the same type and gauge. One manufacturer importing needles direct, another buying from importers, and still an-

other buying what he considers much superior needles of domestic manufacture. The same thing applies to delicate parts, such as sinkers, knocking-over bits, points, etc. Each manufacturer under the different groups or sources of supply may be entirely satisfied with the results he is obtaining, but it is self-evident that based on the cost of the needle itself some of them are paying twice as much for needles as others.

So I doubt if any comparative information of value can be supplied to your inquirer on the subjects as listed. In other words, he has rather answered his own questions in stating that there will be a variation in the figures from different mills due to the different conditions. So anything less than a report from a majority of the mills would hardly give anything that might be considered as average condition or cost on the items mentioned.

CONTRIBUTOR NO. 6147.

Methods of Moving Seamless Machines.

EDITOR COTTON:

In the May issue one of your readers asked how to move seamless knitting machines. Present day hosiery production requires continuous changing of styles, designs, attachments, etc., and in most cases the machines must be moved at least out of the line and in many cases to a work shop.

We have had the same trouble as "CONTRIBUTOR NO. 6067" and have tried several different kinds of lift trucks and homemade affairs with wheels. In most cases these required lifting, which is hard and dangerous, and about as mean a job as dragging by hand.

We finally hit upon a better plan, easier and safer to the machine and men. For "long distance hauling" we use a three-wheel affair which the boys call "skates". Most hardware or textile supply houses have them. See sketch in Fig. 1. Simply tilt the machine, put one under each front leg, and then do the same for each back leg, and it is easy to move a knitting machine or ribber to the shop or across the floor.

For short distance moving we use four knobs which we invented and which give good results. They are cheap to make and require very little lifting. The knobs are very handy in getting the machines through narrow aisles and in turning them around to work at the front or back while at the work bench.

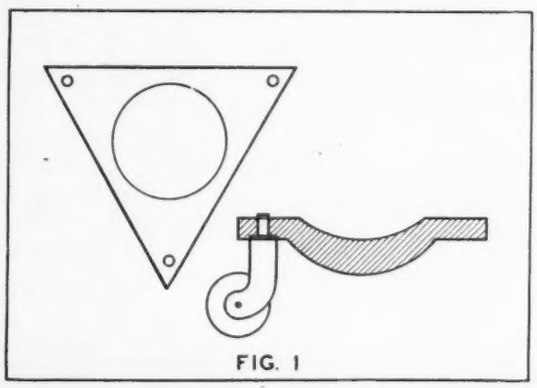

FIG. 1

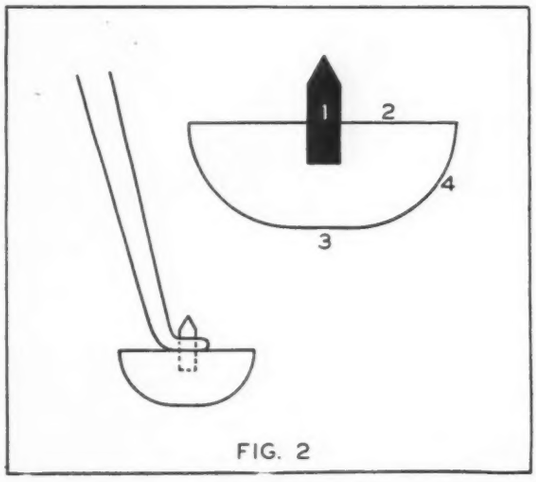

FIG. 2

See sketch in Fig. 2. I would suggest that the knobs be tried out first. They may be satisfactory; if not, the skates will work. We move Scott & Williams, Banner and Standard knitting machines, also Wildman and Brinton ribbers. By using the method described we found that our machines gave less trouble due to being shaken up while moving than by any other method we tried. The knobs will wear out but they are easy to replace and if made of good steel and hardened they will last a long time.

CONTRIBUTOR NO. 6117.

Methods of Operating Seamless Plants on Short Time

EDITOR COTTON:

During a period of dull business and curtailment of production, we have always felt it to be better practice to run a given number of hours each week, rather than spread these hours over a whole week. As "CONTRIBUTOR NO. 6115" states, this prevents several warming up periods of the machinery, the first few hours of which make a large percentage of the imperfect production.

The hours per day worked may be a little long, but are offset by the shutdown at the latter part of week.

However, the present policy of our company is to run our equipment according to production needs. Before this so-called depression hit the country as a whole, our company carried enormous stocks in the grey, for future orders. As a result of the depressed conditions of the hosiery market caused by this depression, and the urgent cutting of costs, these stocks were cleaned out of the grey stores. This resulted in closer production control planning, in connection with the knitting departments. Orders are rushed through the knitting departments, when received, working the operatives overtime, morning, noon hours and night if necessary in order to get shipment as soon as possible. When these orders are out, these machines are either shut off or changed to a number in which they need production. Changing of styles every few days is a common occurrence in our plant, this is done in order to prevent stocking up on styles which are not needed at the time. This

TIME SUPPLIES THE *ITALICS*

EVERY era, every field of endeavor has its pioneers, scions of the adventurous, treking into the reaches of Time through the alternations of storm and calm.

For some, the bleached bones of oblivion; for most, the faded epitaph; for the few, a monument with a temporal record, in which Time supplies the *italics*.

The storm is abating. Humanity and Business, Industry and Finance, Agriculture and Transportation, Commerce and Credit are resuming their march. In every group, there stands out—perhaps for the first time—some leader for whose monument Time has this early been supplying the *italics* for his character, his tenacious ethics and his steadfast service.

We have seen such men quietly remaking the minds of men and turning back into their normal channels the currents of confidence and common sense.

To these men, wherever they are, we make our grateful acknowledgments.

JAMES E. MITCHELL COMPANY

Cotton Yarn Merchants for Three Generations

122 CHESTNUT STREET, PHILADELPHIA

policy naturally makes working hours uncertain for the employees, but conditions today necessitate closer operations all through the mill.

However, under normal conditions, I favor the policy outlined in the first part of this article.

CONTRIBUTOR NO. 6133.

"Zebra Stripes" and Using Boiled-Off Silk for Re-Inforcement

An exchange of correspondence between an inquirer and a mill man who answered his question on this particular problem. More opinions will be published later.

EDITOR COTTON:

We know of no sure remedy for correcting the trouble of zebra stripes in re-inforcements of foot and heel on account of using boiled-off silk for this purpose, other than to do perfect plaiting. This question was brought up on page 129 of October COTTON by "CONTRIBUTOR NO. 6146."

It is common information these days that different lots of silk, silk thrown by different throwsters or backwound through different soaking emulsions, etc., will not dye uniformly, and the mixing of silk of such differences must be strictly avoided.

In this case, your inquirer is knowingly taking a silk of entirely different condition and using it for re-inforcing heel, toe and sole, and knitting at random rather than plaiting, and his trouble is so obvious that it should have been obviated without question. Even where two silks of different endage and of the same nature are employed in re-inforcing a stocking, we find it thoroughly advisable to plait one silk over the other, especially where there is any appreciable difference in the denierage or twists of two different ends of silk. Knitting a split sole will not correct the trouble without plaiting, unless the boiled-off silk is used entirely in making the sole, heel and toe.

CONTRIBUTOR NO. 6151.

EDITOR COTTON:

I was greatly interested in the reply of "CONTRIBUTOR NO. 5141" with regard to my question concerning the probable causes of "zebra stripes" as a result of using boiled-off silk yarn in re-inforcing a full-fashioned stocking.

I was especially interested in this contributor's attitude toward this problem, as he implies that it can be solved by using silk of the same nature for both face and re-inforcing yarn. I should like to inquire further as to whether I have interpreted his reply correctly and, if so, how he has determined that silk used for the face and for the re-inforcements is of the same nature.

About the only means we have found for effectively determining this point as it affects dye materials is to take samples of yarn from the lots of silk as they are received and test them for their dye absorption qualities. As this method has its practical limitations, we shall greatly appreciate information as to the methods used by the contributor.

CONTRIBUTOR NO. 6146.

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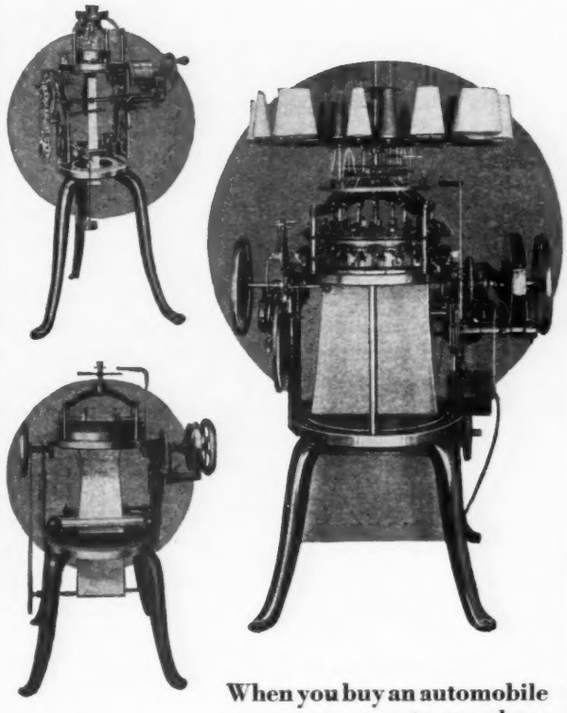

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EDITOR COTTON:

Replying further to "CONTRIBUTOR NO. 6146", I will say that he has correctly interpreted my reply to his question regarding boiled-off silk for reinforcement.

There are very few 100 per cent perfect systems in a full-fashioned hosiery mill, and especially so in regard to handling raw silk. There are, however, certain well known principles which are well worthy of close follow-up. Among these is the desirability of close attention to each individual lot of silk received. Where a mill's production is large enough to warrant the purchase of as much as ten bales of silk in one lot, and where the set-up of the machines is reasonably sure of a certain construction stocking of even a few weeks, it is always advisable to have re-inforcing thread selected from the same lot of raw silk as was selected for the main body of the stocking.

This practice can be carried out to a reasonable degree of satisfaction, and in addition to this practice, as your contributor has already pointed out, it is advisable to take samples of yarn from the lots of silk as they are received and test them for their dye absorption qualities.

Then, in addition to these precautions, we still strongly advise the use and practice of perfect plaiting even though re-inforcing silk is found to be of the same nature as the main silk. Perfect plaiting is such an important performance in the manufacture of so many different types of stocking that even where a stocking is being produced and does not necessarily require plaiting, it is still advisable to keep up the practice of plaiting. This not only gives better fabric appearance but forestalls the possibility of machine fixers and operatives getting careless while plaiting is not absolutely necessary and causing the machines to be out of adjustment when the service of plaiting may suddenly be again necessary.

CONTRIBUTOR NO. 6151.

A "Pass-the-Buck" Boss Helps An Apprentice.

Some practical suggestions on preventing drop stitches on the Banner knitting machine.

EDITOR COTTON:

In "KNITTING KINKS" in the August number of COTTON I read an interesting account covering drop stitch troubles on Banner knitting machines. This particular trouble is not uncommon on other makes of circular machines, but it seems that it befell the old style Banner to have a little more than its share of this ailment at times.

Whose Fault Was It?

I recall very clearly an incident caused by drop stitch trouble on a Banner which kept an apprentice boy in hot water one Monday morning. The boy in question was finishing his second year trying to master the mysteries of a knitting machine and was beginning to realize how little he knew. One Monday morning one of his knitters complained that one of her machines was making a lot of menders due to a drop stitch in the instep, and she could not understand why it should behave so badly when it had run good during the previous week until stopping time on Saturday.

The apprentice had learned that knitting machines were fickle and would develop all sorts of ailments apparently over night and, if for no other reason, just to be contrary. He set about to fix this one in a hurry as the bonus was based on good work and was worth every effort. After a hard morning and many menders, the apprentice found "how come" all the drop stitches.

In making a pattern cam change a gap was left between two drum cams which was long enough to allow the drum lever to fall into the gap, and this would permit the yarn finger to fall low enough to strike the needle hooks while the heel was being made, causing latches to close. It was all as plain as day and very simple to overcome, once it was discovered, but while working on this machine a number of things were found, and suddenly another discovery was made. The machine did not belong in this row and must have been swapped between Saturday noon and Monday morning, and it must have been moved very carefully on a truck, as there were no signs of its having been dragged on the floor.

Well, the boss had a brother whom he helped a great deal, often at the expense of others, and to make a long story short, this machine came from the brother's line and was "donated" to the apprentice as the stock numbers which ran in rotation revealed. Then, to make a bad thing worse, the boss asked the apprentice if he was having any unusual trouble, and he said "No", as he was in no humor to give out information by this time. Now, was the boss trying to find out how much the boy knew or was he merely passing the buck in a crude way?

Causes of Drop Stitches.

In connection with the foregoing, I would like to mention a few things which will help to cause drop stitches. Latch rings with rough places, mouth pieces not matched perfectly even with the latch ring, latch ring set too high or too low, narrowing picks not working freely, widening picks drawing needles too low so the stitch on the needle causes the latch to close, latch ring not set in proper relation to needle circle, loose or badly worn needle bands, needles out of alignment or needles without friction to hold them in place—these are some of the causes. Sinker cams not properly set will also cause drop stitches under certain conditions.

Many improvements have been made on the later model machines which help to eliminate drop stitches; however, real brain teasers are often found. A common fault with many machine fixers is that they begin fixing a machine before they really find out exactly what is causing the trouble, and they usually go from the frying pan into the fire. It is very simple to say, get to the bottom of it, diagnose your trouble carefully, stop guessing, and your job will be easier—yet we guess—and miss—often. Why? Because we are all still apprentices.

CONTRIBUTOR NO. 6155.

The KNIT GOODS MARKETS

WHEN it appeared some few weeks ago that the fall spurt in full-fashioned hosiery had run its course and there were reports of a manufacturer here and there contemplating wage reductions, the word went out unofficially from an executive of a Philadelphia mill, "First, reduce operating cost by the elimination of every item in overhead not absolutely essential in the running of your plant, and then, if you cannot sell at a profit, do not accept the orders."

Four years ago, hosiery prices began to weaken at a time when large retailers were assumed to be placing orders for holiday goods. It was virtually the first pre-holiday break-down in years. The portent of a weakening in the hosiery market preceded the financial crash by about one year. The uplift in hosiery market this year admittedly led the general improvement in the light textiles markets.

Misled by buyers for the trade, hosiery manufacturers were premature in going full steam ahead with production, with the result that, in a sense, there is presented a repetition of the interruption in 1928, with this difference, that recessions at this time are the inevitable result of over-estimating demand, both as to volume and its duration, and underestimating the effect of three years of depression while overlooking the fact that these three years of descending prices have produced a changed consumer attitude toward values.

Manufacturer response to conditions incident to the weaker market attributable to an excess of zeal in meeting hosiery demand in the rising market that existed for some weeks, beginning in August, has been fairly prompt, with the result that seriously menacing accumulations of stocks seem likely to be in considerable extent averted. A partial restoration to a more active situation than that which was feared generally, was forecast in a demand for holiday hosiery and, incidentally, a stronger unit of value on which to enter the coming year.

Hosiery buyers for large retailers and wholesale distributors encouraged manufacturers, unwittingly, perhaps, to rush production. Orders placed with one mill were duplicated in another, as if buyers believed such a procedure necessary for assuring them deliveries of all the hosiery they might want. They protected themselves at the risk of the manufacturer. Not all of the goods ordered for buyer protection were taken in. It came to be disclosed that some deliveries scheduled for September were held up by the buyers, and that the goods later were thrown on the market for the financial relief of the manufacturer who had been misled by a free flow of orders.

While many of the mills which had inaugurated double shift schedules and were in production day and night have cut output to bare necessities, some establishments continued operating 21 hours in 24 through November, and the managements of a few stated their plants would be engaged continuously on the same schedule until the close of 1932. These mills were the exception and not a criterion. For example, jobber-controlled mills had no letdown in shipments. Then there were some completing large contracts for chain stores.

It appeared to observers close to the trade that the harder hit mills in matter of an ebbing demand were those distributing their branded lines directly to the retail trade. They could not afford to cheapen their lines at the risk of destroying trademark values, and mills which make no pretense at identifying their goods to the trade or consumer, took advantage of a suddenly created condition for which they were not responsible, and the unbranded entered price competition with the branded.

If the several producers of the much heralded non-run type of stocking are 75 per cent correct in their surmises, an important step has been taken in building up utility as a factor in higher units of value, a matter to which much serious thought has been given this year. In its palmiest days, however, the hosiery industry profited by style rather than utility, so that efforts at advancing hosiery in all lines on a basis of utility and longer life appears as in direct antagonism to the basic thought of style for leading the way to adequate unit value, for more profitable trading.

Is Non-Run Full-Fashioned Hosiery the Start of Revolutionizing the Industry?

The history of "the revolution in the full-fashioned hosiery industry" which is expected by spokesmen for non-run hosiery interests may not be written for several years, but it is the prediction of these interests that women's stockings, absolutely immune from danger from runners, will be accepted generally by the time the springtime markets of 1933 get under way.

A trade publication's recent survey, through correspondents, of the reaction to offerings of the innovation in October is regarded by owners of the Schwartz patent, under which several mills are operating as licensees, as a mirror of trade and consumer opinion. This appraisal of the stocking from the standpoint of sales by no means can be construed as an augury of success. It is pointed out, however, that no radical change in style or construction ever was an overnight achievement, and that novelties of mushroom growth in favor never had a long existence—lace stockings, an innovation of the early part of this year, made an instant hit and took the trade by storm, heavy investment being made in tackle for producing the Frenchy hosiery. Laces followed meshes into and out of the picture within a few months.

It appears, from intimate knowledge of the methods of the owners of the non-run Schwartz patent, that they are laying plans for permanency and taking no step toward any change in the fabric or issuing licenses except upon careful consideration, and it is a common prediction in the trade that, as in the case

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of most improvements which became a permanency, the non-run type of hosiery by this time next year will be as superior to the present construction as the full-fashioned stocking of today out-classes that of 1901. In any event, declare patrons of the Textile Patents Corporation, controlling the Schwartz patent, their product will come to be recognized as the first step in a complete revolution of the manufacture of women's full-fashioned hosiery.

Improvement in fabric design probably will be progressive, following the course in fineness which can be traced by many of the older manufacturers from 36-gauge to 60-, machines of the latter gauge being in operation since October in the Oakbrook Hosiery Mills, Reading, the pioneer in the production of this degree of fineness in hosiery in the United States.

Movement for More Seven-Thread Silk Hose Noted.

Silk importing interests are credited with having persuaded a few manufacturers of full-fashioned hosiery to specialize in seven-thread goods. Others have been discussing the matter. The sponsors for the movement for substituting seven-thread silk for chiffons make it appear that the masses buy for price, since that is what most retail stores feature. Give the shopper more service, with no material increase in price, and win new customers, is the substance of the suggestions of certain raw silk interests to manufacturers, for having them add an ounce or two of silk per dozen stockings. A good thing for the silk trade, and not bad for mercerized yarn producers, since many buyers for the trade specify mercerized hems for medium service weight.

Even though the depression is conceded to be yielding gradually to the apparent upward swing in business, it is represented by proponents of more-silk-in-the-stocking proposal that with winter just around the corner, it should be an easy matter now to promote sales of seven-thread stockings, as preferable to chiffons. While they should fetch somewhat higher prices, manufacturers who have given serious consideration to the matter say an increase in sales which would result would be sufficient compensation for making the change, even with no price increase.

"I might think more of the suggestion if I did not feel that the inspiration for it was a hope of selling mills more silk poundage," said a mill owner, who found that under a formula which he says he has worked out, a seven-thread stocking might be made at an insignificant increase in cost over chiffon construction, taking into consideration fewer irregulars, seconds and menders. And he thought that with propaganda for the consuming public, there ought to be a reasonably larger sale.

If non-run stockings can be sold for $1.35 a pair, the price set by manufacturers of the new type, it is held by the mill owner referred to it should be possible to create a demand for seven-thread regular knit hosiery at one-half the price of the non-run. This would be more profitable business than making four-thread chiffons to be sold to dealers for around $4 a dozen, an arbitrary figure set by buyers and accepted by some mills.

A seven-thread stocking with some outstanding distinctive feature might prove a step up toward a better dollar value. It doubtless would receive far more consumer support relatively, than two-thread, which is being pushed as ideal for mills with equipment for 54-gauge and finer, and prove more profitable, since there is no volume production of the latter and just as much price resistance from the element of society that revels in vapor fabric for hosiery.

48-Gauge Three-Thread Demand a Recent Development.

Rather lively interest in three-thread silk 48-gauge hosiery continued through November as a result of promotional work undertaken a month earlier. One or two buyers who distribute among retailers large and small professed to believe there existed a scarcity of that type of stocking, in the gray. A buyer of another type who maintains close contact with mills and takes only in the gray, said at the time he would be able to supply any demand.

It appeared to persons on the sidelines that the matter of price was the explanation for an alleged scarcity for the buyer first referred to and a plentitude as appraised by the other. Movement of 48-gauge three-thread silk as a holiday item was planned by one concern. The stockings were represented as distinctive, in a way, and thought to be attractive as a dollar-a-pair item with the development of consumer interest in holiday stockings—attractive to the buyer of hosiery for the retail store, since the proposed price to dealers would have provided for a 100 per cent mark-up when sold for a dollar a pair.

As less than five per cent of the total full-fashioned machines in place in March last were of 48-gauge, according to a Taylor survey, scarcity of hosiery of that construction, in the presence of only very modest demand would be readily accounted for. With the dip in volume sales which may be said to have made itself felt in the latter part of October, there appeared an abundance of 45-gauge stockings of very good construction, at prices which may have made even a low quotation on 48-gauge seem high.

$5.00 a Dozen for 69-cent Hose.

Announcement a few weeks ago by the Berkshire Knitting Mills that the price of its four-thread silk 42-gauge number had been reduced to $4.25 a dozen from $4.50 caused virtually no commotion in the wholesale markets as it was commonly reported some few manufacturers had been accepting offers of $4, a price which some retailers have set as their maximum for a 50 cent stocking. Others have indicated $5 a dozen as their arbitrary price for stockings to retail for 69 cents. The suggested $5 price indicates a new bracket, although hitherto regarded in the trade as an awkward price. Simultaneous with the announcement by the Berkshire of a 25-cent drop in its price of four thread 42-gauge, the announcement of the Holeproof Hosiery Co. of Milwaukee, of an advance of 10 cents a dozen in 35 cent numbers to $2.55, appeared.

A 45-gauge stocking from a Philadelphia mill was being offered early in November to department stores for $4.75 a dozen, or 25 cents a dozen more for small quantities. It was stamped "guaranteed 45-gauge." The only cotton in the stocking was in the sole re-in-

forcement. It carried double picot and embraced all the talking points. A 45-gauge line from another mill, name not disclosed by the selling agent, was quoted $4.75 also and contained no cotton. That was the type of stocking being sold in an exclusively women's shoe store, for 50 cents a pair. Taking into consideration returns by customers and additional store overhead by reason of carrying a line of hosiery, the mark-up no more than left the store out whole, on sales at 50 cents a pair, it was officially stated, with the explanation, "Offering hosiery of this quality at a half dollar is the most effective and least costly advertising for the shoe store that we could use." Expressed in another form, the stocking manufacturer selling his 45-gauge goods for $4.75 a dozen is virtually paying for the shoe advertising.

As demand for standard types of hosiery fell away in the first half of November, it was not uncommon to hear in the trade that "buyers were calling for 42-gauge goods at $4 a dozen." There seemed no doubt some mills were supplying them at that figure, and even a lower quotation was heard. In calling for lower prices, retail stores were defeating their own ends, in encouraging a continued low dollar volume, while complaining almost unanimously that one outstanding difficulty with which hosiery retailers had to contend was light profits due to current dollar volume of their sales. This complaint is of course not new, but was uttered the louder when the unit volume was being described as unaccountably low.

Manufacturers' profits began to shrink even before prices were lowered, for soon after evidence of surplus production became manifest there was inaugurated another curtailment campaign, in some establishments. For illustration, a manufacturer selling nationally advertised brands to retailers reduced the number of active machines, these being engaged chiefly on the concern's better types. Customers were calling mainly for the company's higher price numbers, by way of "electioneering among their trade for higher dollar volume preliminary to launching the usual holiday drive." The manufacturer was giving the dealers co-operation by shutting down on output of promotional numbers, so far as consistent with maintaining volume of sales for providing a margin of profit on plant operation.

Shoppers Skeptical of Underpriced Hosiery.

It became a trade opinion early in the fall that, while holiday shoppers would keep an eye on price, they would be skeptical of prices in the range 39 to 59, as suggested by an experience of a Philadelphia ready-to-wear shop with a special offering of right good 45-gauge stockings for 50 cents, for first quality. Customers, even if impressed with the appearance and general construction, were wont to ask "what's wrong with these stockings, that you sell them for only 50 cents?"

The merchandise manager took the cue and had the stockings taken off sale at a half dollar a pair and priced 69 cents. At the latter price they sold without assurance they were not irergulars. The store in question is one that never should have offered its clientele 50-cent stockings. A competing establishment ran a sale of fairly good hosiery at that price and was so successful that others raised the question of the expediency of doing likewise.

It was the consensus of department managers that stores appealing to a clientele that buys the higher price goods in other lines could not appropriately display hosiery prices so low as to likely divert interest of their customers in the class of goods that fit into the coveted dollar volume rut. In other words, it was reasoned, do not display low-price hosiery on the same floor with the very fine gauge or featured lines selling, with little consumer resistance, at profitable prices.

If men bought the hosiery for the female members of their households they would select the better at the higher prices, while woman, if she pays her bills out of her own funds, or allowance, is said to be liable to be influenced in great extent by the price tag and style rather than intrinsic value. This on the word of store managements who have observed the result of marking prices for a single pair a few cents or a nickel higher and selling two or more pairs at an indicated saving equivalent to the mark-up.

Giving 45-cent stockings a price tag of 47 cents and exploiting two pairs for 90 cents, and 50-cent stockings marked 55 and then tagged "two pairs for $1," is said among retailers to have fully vindicated Barnum.

Low Prices from Mills in Distress.

Among manufacturers of full-fashioned hosiery of standard construction for the upper price brackets there was experienced some measure of exemption from the recent price movement. The better department stores were interested in only types distinctive for quality or some outstanding feature for their holiday offerings. These classes seemed to have been not much affected by market recessions attributed to relatively light retail sales and excess output, and prices ir this class were steadier as mill after mill adjusted production to firm orders plus a reasonable allowance for eleventh hour demand for the last two weeks of 1932.

The production and shipping reports of manufacturers to the Bureau of Census of the Department of Commerce for September made a showing that was much at variance with November conditions. Making comparison with the corresponding month of 1931, the September 1932 production of hosiery, all classes, was increased by 921,020 dozens by 326 identical mills. This was met by a decline of 912,379 dozens in stock in mills at the end of the month. Shipments showed an increase of 1,033,623 dozens. Unfilled orders at the end of the month represented a gain of 1,253,541 dozens, but subsequent developments were of a character to indicate some of the orders had not been filled, to the beginning of November. In other words, there was reported a serious lack of September and October shipping details. Reports to this effect often were given for radically sacrificial quotations on some offerings of hosiery in the lower-price brackets.

Another explanation for acceptance of prices spelling loss for first hands was the outturn of several mills, in the hands of creditor committees or receivers,

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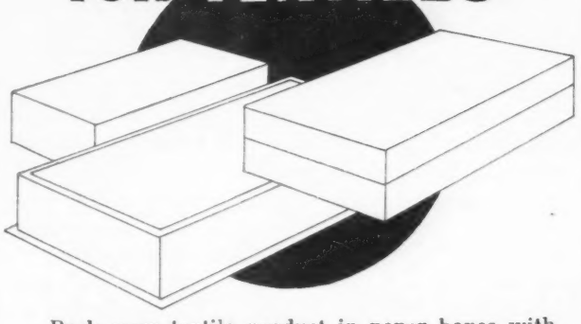

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being offered at figures showing no profit. Receivers in at least one instance boasted, in obtaining an extension of the receivership, that they were operating the plant at a profit. Meanwhile, however, plants were depreciating and approaching obsolescence, and it was the admission they would have to be sacrificed in the very near future. It seemed to some that receivers, so long as they could pay running expenses, were ambitious to defer liquidation and distribution so long as possible.

Some few Philadelphia and nearby full-fashioned plants are apparently going through that slow process of final dissolution, which in the case of a dozen or more small to moderate size concerns, may be expected to culminate in the usually orderly manner not later than the traditionally dull period just prior to business in hosiery getting into its spring trade. The first interruption to the trend upward occurred last month. The second will precede the Spring spurt, which forecasters say will be due for a start along in February.

Bumper Production Precedes Dull Market.

A glance at the September reports of mills to the Department of Commerce as to women's silk full-fashioned hosiery is clarifying of the conditions which resulted in the less satisfactory markets, for it is indicated that almost 1,000,000 more dozens were made than in the 1931 September, while stocks in mills were decreased by a little more than 900,000 dozens, and shipments less cancellations gained less than 400,000 dozens. Women's silk seamless, while amounting to only about 25 per cent of the production of full-fashioned, scored a gain of about 93,000 dozens in production, something over 50,000 dozens in net shipments and dropped around 30,000 dozens in stocks in mills.

Gaining over 100,000 dozens in production, juvenile hosiery aside from infants, increased nearly 300,000 in orders booked and gained substantially in matter of net shipments.

A rather amazing showing is made in an analysis of the tabulated reports covering men's seamless half-hose, production during September increasing over a half million dozens as compared with September a year ago, while stocks in mills at the end of the month had decreased by over 600,000 dozens. Net shipments during the month increased by more than 600,000 dozens. Shipments and drop in mill stocks amounted to 1,000,000 dozens, or 200,000 dozens more than the increased output.

Report of an increase of 3000 dozens in men's full-fashioned half-hose conform to statements of individual Philadelphia mills of a better demand since the radical drop in prices. A southern manufacturer is reported by buyers as offering men's silk full-fashioned half-hose at a price which would let them through very profitably as half-dollar sellers in retail stores, on the basis of 10-thread. A quoted price is said to be less than cost of production in either of several Philadelphia mills.

A hosiery trade analyst commenting on low prices for men's half-hose and the indicated trend to the cheaper types, says manufacturers and retailers jointly are responsible for the low unit of value of men's half-hose. Both appreciate now, however, that it is dollar volume that keeps the machinery running, and, conceding there will continue a broad outlet for price goods, it is said to be indicated among traders that the tendency is to the better types and the featuring of styles for which adequate prices can be obtained.

The Aycock Hosiery Mills, South Pittsburg, Tenn., are said to be producing a very desirable type of men's sock in English rib effect. A New York leading retailer a few weeks ago announced a sale of 40,000 pairs of men's imported derby wool hose, at 47 cents a pair. If the advertising was correct, this was about 15 per cent of a month's import of wool hosiery of all classes of British origin.

Some of the half-hose mills which have been going more extensively into the production of cotton in mixture with either silk or rayon—both combinations gaining in favor, apparently, as a price item—may be said to vindicate the analyst's observation that manufacturers are responsible jointly with retailers for the low unit of value.

Trend Seen to Men's 10-Pound Union Suits; Jobbers Ready to Order Women's Spring Cottons

Large distributors of men's heavy weight cotton underwear, summing up outstanding changes noted in this season's distribution, state the 16-pound union suit has been in increasingly light demand in most sections. This is said to be due mainly to the general trend to lighter weights. But the aversion for the heavier suit can be ascribed also to generally milder winters and lateness of wintry temperatures this season.

There still is fair demand for 14-pound suits, it is stated, but exceeded by that for 12-pound. In some sections, notably among southern retailers, shipments for the current season have been in greater volume in 10-pound suits, according to some followers of the trend as it falls under their observation. Latterly some mills were dilatory with their shipments of late orders for winter weights, but by the early part of November had caught up and were receiving practically no complaints on the score of late delivery.

Taking a peep into 1933 and anticipating that manufacturers will come on the market around April, at the latest, with heavies, there is a suspicion that prices will be a trifle lower than the scale for the season for which production is out of the way. It is recalled there was considerable wobbling among leading manufacturers before they got fairly started with their fall business. Several times, say buyers for jobbers, manufacturers were in and out by turns, causing some confusion. But, it is declared, the season ended fairly satisfactory from the mill standpoint, and distributors who have commented on market conditions from virtually every angle, seem assured they will have cleaned up their holdings and may find it desirable to place small repeat orders for the protection of favored accounts among retailers.

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TURNING THE WHEELS OF PROGRESS

NEUTRALITE DETERGENT

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It has powerful detergent action.

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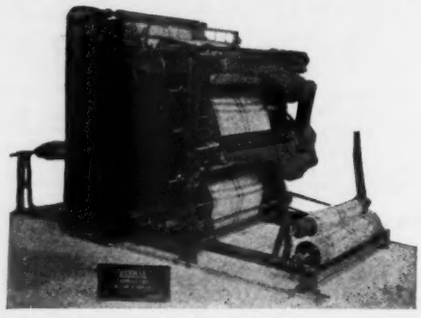

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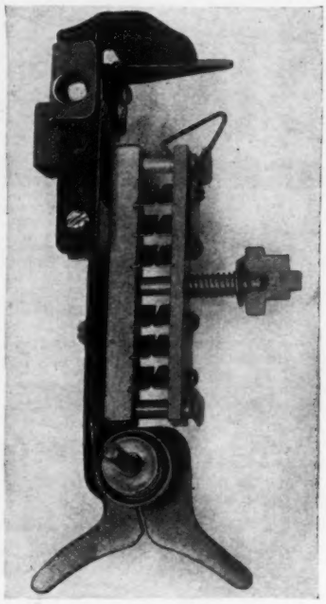

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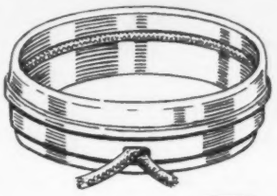

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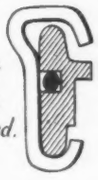

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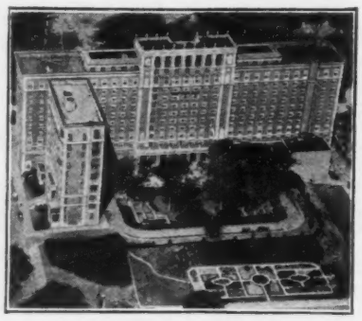

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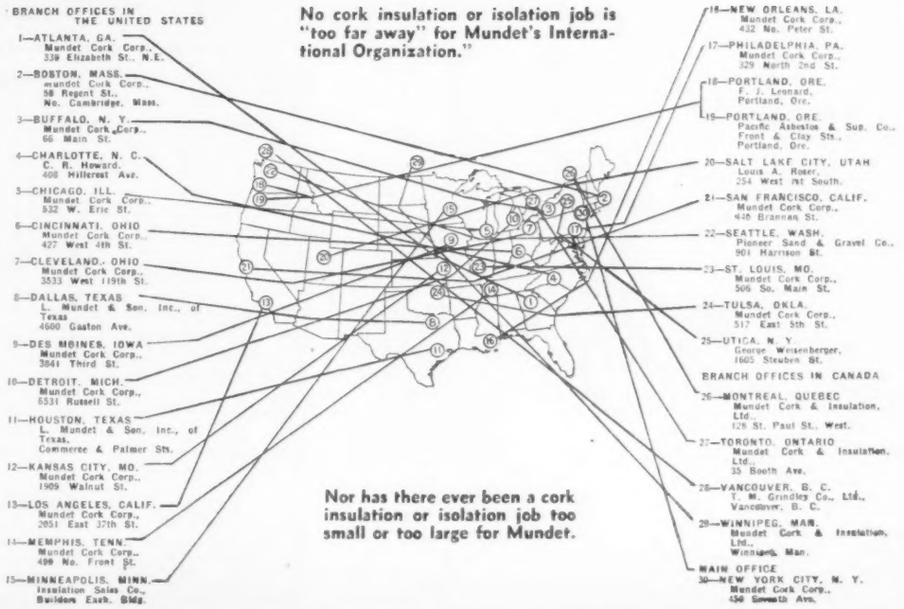
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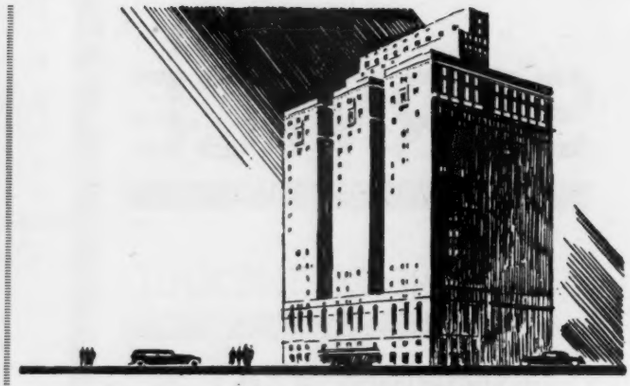

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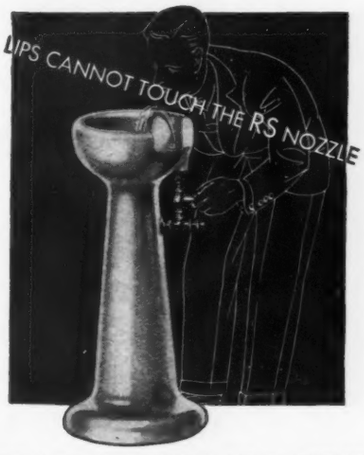

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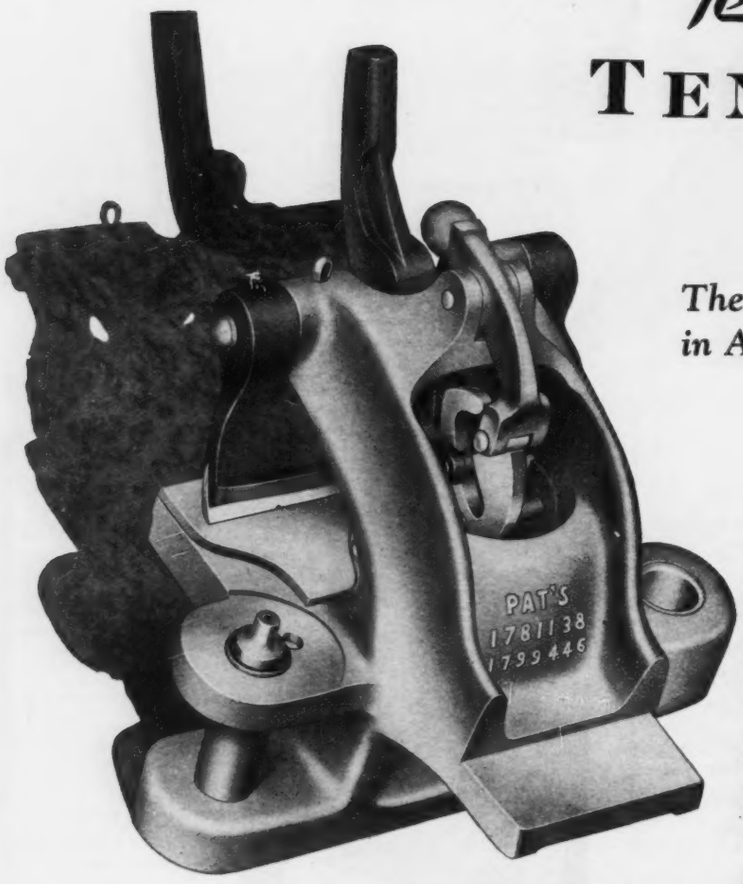

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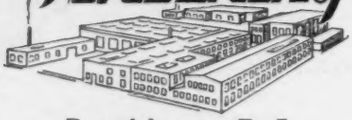

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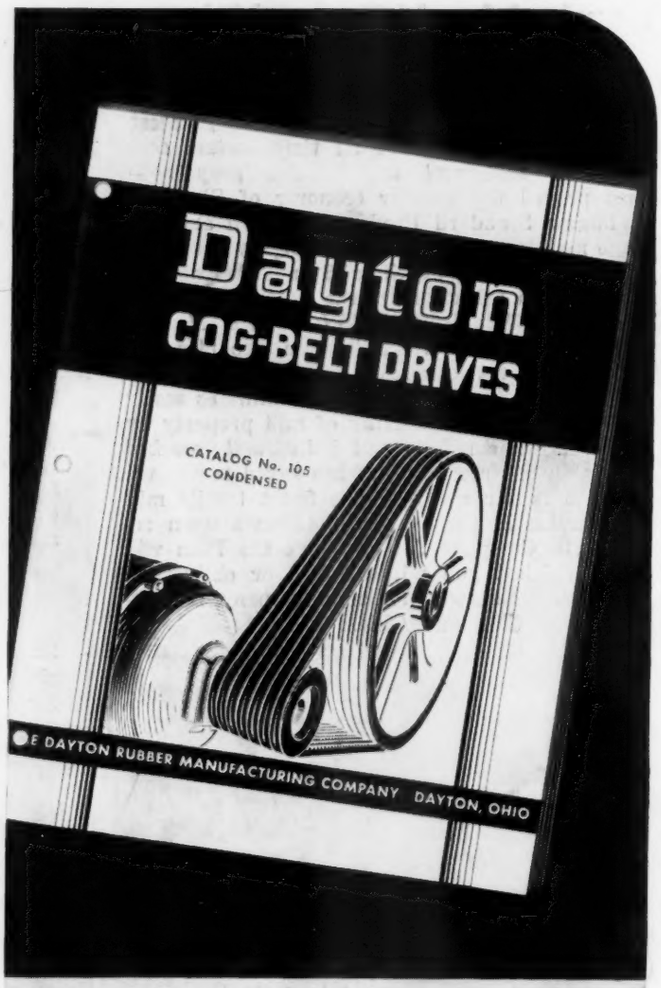

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